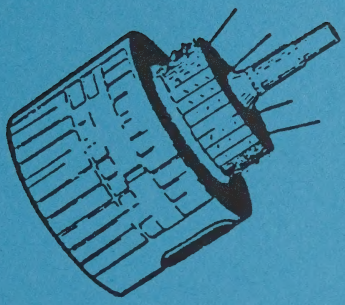
NEWSLETTER No. 22



REMOTE IMAGING GROUP

SEPTEMBER 1990

REMOTE IMAGING GROUP (R. I. G.)
NEWSLETTER No. 22 SEPT 1990

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NEWSLETTER No. 22 Sept 1990

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EDITORIAL & SECRETARIES PAGE

As I finally write this column I wonder if we will achieve the target of the fourth issue this year, that is in December. As you have gathered there have been significant problems, mainly time related, but a few technical as well. There will be a December issue, published sooner than you think (!) but it will not be as thick as previous issues. The usual problem of shortage of contributions from members remains and I therefore request again any remote imaging related articles that you are able to produce. They will be printed. Contributions on disk are especially welcome, in ASCII or generic word processor format. Give me a call if you are planning to send a disk for the first time and please put your name on it!

How many of you know that RIG has a PRESTEL mailbox? What's PRESTEL you might say. Anyway for those who do know we have agreed as a group to look at the mail at least on a weekly basis. The number is 011136914 with aliases RIG and REMOTE IMAGING GROUP. If its not used then I expect we will cancel the service.

Also on the telecom front, Henry has suggested that we resurrect the Bulletin board service. Bob Leggett set one up a while ago for a trial period and we had approximately 3 calls in two weeks!! The best way to approach this is for all members who would wish to use the service to contact Henry, by phone or letter saying what you would like to get from the service and how frequently you would use it. Current NOAA and Russian satellite predictions are obvious candidates. Images in the .GIF format would also be provided. There is some excellent imagery available on the Dallas RIG (DRIG) BBS some of which we could transfer to a RIG BBS, but only if there is sufficient demand in the UK. It could also be used as a mailbox for messages and input to the newsletter. So please contact Henry.

Members may like to know that Dartcom have set up a BBS which has available current Kepler data and other information. The BBS number is 0822 88249. The specification is 1200 baud, 8 bit, no parity and 1 stop bit.

Thats it for this issue, sorry its been so long coming, it can only get better!

Phil
RIG Secretary & Editor

Chairman's Waffle

Well, we eventually got No 21 to you. It was a long hard struggle but we made it. It was a bit more expensive than the previous newsletter pro rata, but certainly not a 70% increase. After it was posted and after the time it takes to digest the information contained therein, I received several complimentary comments about it, such as "it was well worth waiting for". The problem now is how do we get this one and the December one to you before Christmas? I don't think we can, but you never know what pleasant surprise might lie on the horizon.

Work has been very hectic this year and it has not left me with much time to spare. However, to my wife's amazement, I asked if she could find an overnight bag for the dog? After a few seconds things started to drop in place and she asked how long for? I replied "about a week", and the panic started. Mind you, we were on the way less than 24 hours later! As someone once said "it's surprising how quick you can pack a case when you have to!" Previous to this outing, I think we had been away from home for a record period this year (assisted by the extra rallies we've been to), and this event nearly doubled it. I must be getting into bad habits - Farmers don't waste time on holidays, especially in the middle of Summer!

Well we had 6 days touring Scotland, after Henry had a little incident on the A1 just south of Weatherby. I was in the fast lane as usual, travelling about the legal maximum when a woman driver (this is factual) suddenly braked for no apparent reason. The man driving the car behind her only just managed to avoid colliding with her but Henry didn't quite do the same with him. He had slowed down to about 45mph but Henry only managed 55mph in the distance available, and needless to say modified the aerodynamics of both cars! Fortunately for both of us, the slow lane emptied 'just like that', and we both slid over to the hard shoulder and exchanged the data files as required by law. However Henry's plastic bumper was lying on the white line between both carriageways and was causing a bit of an obstruction. I walked back along the hard shoulder to get in a position to retrieve it. Fortunately an oncoming motorist saw what had happened and flashed his lights to me to get it back quick. Quick being an under statement, I don't think he travelled many feet before Henry was back on the hard shoulder with the obstruction.

As it was plastic it hadn't been damaged too much and was rammed in the back seat to the disgust of the dog who hadn't got much room anyway!
I was very lucky because the impact had pushed the horn onto the radiator. It had marked it but not damaged it! This left us with a badly bruised and battered vehicle which was just about roadworthy and 2 smashed headlights. This all happened about 2.5 hours into our quick break - not a good start! We continued to the next exit and surveyed the remains to see if anything could be done to reduce any residual hazard. After a little tidying up we continued with our journey and found accommodation just north of Newcastle where we were able to actually tie the bumper back on where it should be, much to the satisfaction of the dog!

This cosmetic action made our misdemeanour less obvious and less eye-catching. We continued our tour around Scotland without any further major incidents. The visibility while we were on the North coast was very good enabling us to see many Islands from Dunnet Head and along the coast to Cape Wrath as well as the Eastern end. One small inconvenience were the many flying ants at that time of year.

You have all heard about my old combine - the C suffix one, well she might have survived this year but I was offered a F suffix one at a very reasonable price and couldn't say no to a more recent model. The main attraction was that the new one had obviously been well looked after and hadn't been used last year. Being surplus to its owner's requirements, who happens to have several very large modern ones in his agricultural contracting business (he had only bought this one because when he wanted to do some of his own crops when his own big machines were miles away). If Henry hadn't bought it, he was going to sell it to someone who would have broken it up for spare parts. It was in very much better condition than the C suffix model which can now put her feet up and retire gracefully bit by bit! The F reg one has now completed its first harvest with us and only had a few minor hiccups. I shall have to make certain that this one doesn't try to digest any foreign objects!

With all the panic of the last few months I had forgotten to tell you about the committee's visit to the N R S C at Farnborough in May. It was obviously going to be interesting but I don't think any of us had expected it to be as good as it was.

The visit was supposed to last from 2pm to 4pm but Islwyn Thomas kept us fully captivated (he couldn't get rid of us) till after 6-30pm when the last few of us left! Our most sincere thanks to the establishment and to the personnel concerned. If any of you get the chance to visit them, don't miss it. It is extremely interesting and worthwhile.

While we were going to press with the last newsletter the PCSAT III arrangements had not been completed, and were only included in skeleton form. This has all been tidied up now and everybody is telling us it's the best thing that has happened. The system will work with a 8 bit 8086 machine with certain limitations (it works on my V20 10MHz IBM) but is much better on a 286. It requires a VGA card or better for best results. It will however work on a EGA card (but is very colourful) and it is not really recommended. If you only have an EGA card then don't bother unless you are going to upgrade in the near future. We have heard of a few snags in certain circumstances mainly with the animate programme. The Expanded Memory Manager seems to be something to do with the problem, causing the clock to stop while it is receiving a picture. It then misses the start tone on the next picture. The manufacturer has now come up with an alternative program which is suitable for 286 machines and above called PROANIMate. It doesn't seem to affect 8 bit machines. If any of the early purchasers are having problems please let us know and we will forward the new programme to you.

Unfortunately it is very difficult to predict which combinations of hardware are suffering with this problem. Some machines suffer and other nearly identical ones don't. The package consist of a half card to plug in to you PC, software and a handbook. Two sources of signal can be handled via a 9 pin D type. The 2 sources have their own level pots but it will only handle one input at a time. For those of you with a suitable machine and the sum of 137.50 pounds at Rallies or an extra 3.50 pounds for post and packing (UK), you can have a very useful system. This package is being handled by myself to relieve Phil of some work so he can concentrate on the other things that the Secretary has to do.

I hear from Timestep (Dave Cawley) that he now has a HRPT system working in prototype form at present. He hopes to be in a position to go into production from approximately February 1991 onwards.

We will keep you posted on this one because the pictures that he has sent me are superb. -- Watch this space.

From all this excitement you will have possibly gathered that Henry has been lashing out (a rare occasion - ask my wife) on an Orchid Pro-Designer graphics card with 512k on it. I have had the loan of the groups NEC Multisync 3D display to give a couple of demonstrations. Unfortunately it had to go back and I have been temporarily loaned a black and white equivalent. Even this is much better than the standard frame store, giving a 800 X 600 X 64 resolution. However I hope to obtain the colour version shortly possibly at Christmas if I can find a stocking large enough and persuade the wife that it is essential! 10 years ago we all thought that a solid state frame store was wonderful, what would things have been like without them? While on the subject of display cards, may I recommend that you read the V G A article by Dave Cawley of Timestep. If you don't know much about these things make sure what you are thinking of buying is capable of doing the job you require it to do.

I think that most of you know the reply rate from our secretary. Phil is obviously overworked and any help that can be obtained to assist him would be extremely useful. The biggest problem is that for ease of communication and many other things, any help that might be forthcoming needs to be in the close vicinity of Leighton Buzzard. The secretary's job is not a few minutes per week exercise but more like a three man job. We do seriously need offers of help especially if you live nearby. It is not the technical side that needs looking after but the more mundane things like office work etc. Which also reminds me that we still do not have a permanent treasurer. Dick Boardman has offered to do the job on a temporary basis, but we are still looking for offers on a longer term basis.

Newsletters nos. 8 and 11 have been reprinted so that we can continue to supply back issues for the 1987 year. I know that a few of you were given a very poor photocopy of no 8 to save you waiting. Because these are now in stock if any of you require the reprinted version then contact me and I will send them to you. Occasionally some newsletters have not been collated correctly. Sometimes a sheet is either missed or duplicated. If this happens to your copy please let me know and I will send you a replacement. This is not because we have changed printers, but it does happen occasionally, even on the most expensive collating machines (but less often).

Don't do as Henry did! We have a large tractor whose battery needed charging. No problem - I left it on charge all day at about 10 amps. Nothing wrong with that, it is a large battery. I started the tractor and it all seemed ok. I stopped the tractor and I was then distracted for just a few moments while I attended to something else. I returned and disconnected the battery from the charger --- BANG! The top blew off the battery and Henry had acid splashed in my eyes. Not a lot but it was very painful. It instantaneously blinded me for 2 or 3 seconds. I rotated my eyes to spread the acid out and dilute it. My sight returned slowly and I rushed to the nearest tap and squirted water all over my face, eyes and upper clothing. All this took only 20 or 30 seconds. I was very fortunate in that I only got a little spray from the acid and that a water tap was only a few yards away with a short length of hose attached. "If only" I had disconnected the charger from the mains supply first. Or "if only" I had disconnected the battery immediately I had stopped the tractor the gasses would have been ventilated by the radiator fan and not reached explosive strengths anyway. I won't lecture you after this event but be warned and don't let it happen to you. I should have known better. It was only 12v - you don't get a shock off 12v, well not the electrical kind!

After mentioning shocks, I should also advise you of another shocking experience. The T.V. had gone wrong. Eventually Henry got around to having a look at it. The tube appeared to be drawing too much current from the E.H.T.. I disconnected the E.H.T. and placed it well out of harms way. I thought that the problem was an internal problem in the tube. I charged a large capacitor up and flashed it across the tube to dislodge or splatter the cause. There happened to be a 1000v 0.15uf handy, so I found a point in the circuit with 1000v on it and charged the C up to 1000v. I then carefully discharged the C through the tube but too no effect, so I carefully placed the C down and had another think about the problem. I could not find a cure so I eventually decided to scrap it and cleared my things up. I picked up the C and then dropped it very quickly because it was still charged up after at least 10 minutes! I hadn't shorted it out first! Fortunately Henry was high resistance and didn't get a bad shock, it was however an unnecessary one! -- Be Warned! -- You don't get that sort of problem with transistors or integrated circuits!

Whilst at the Emporium I noticed a box labelled Oscillographs. These turned out to be a small mirror suspended similarly to a taut band system and controlled by a coil and magnet arrangement.

They are all self-contained and relatively easy to mount. They were quite cheap and Henry soon had them in his possession. A similar item is used in U-V recording oscillographs and these have quite a high frequency response. Testing the new acquisition with the aid of a audio signal generator produced very large deflection at very low frequencies, but as the frequency is increased the deflection decreases. To counter this the output from the generator can be increased within the limits of the generator, but I reached a limit at about 500Hz where no further deflection could be detected. If this frequency had been higher some form of optical system could have been designed to use these devices. Alas however they have now been shoved into the garage.

'Garage' reminds me that some of you are not using the Queens English as she should be! A 'garage' is where your vehicle goes to be repaired, refurbished, refreshed, rejuvenated, reinvigorated, resuscitated, revitalised, reconditioned, reconstructed, remodelled, renovated, restored, resprayed and possibly a few more. The word garage also appears on application forms to local authorities for planing permission. That is where the connection with cars end. The main purpose of a 'garage' is to have somewhere to stuff things until you have time to sort them out. I should know, I have two of them and the last thing they are used for, is to store cars in. They did have a car in them for a few days of their life, but I hasten to add it was just to say that I had used it for the original purpose as stated on the plans. If you don't believe me ask your friends. I bet that 80% or more are used for purposes other than the storage of cars.

In the popular press an electronics monthly magazine included an article about a laser diode package. The LDM135 module consists of the laser diode + collimating lens and drive circuits. The units were priced :- 1 mw 195 pounds, 2 mw 225 pounds and 3 mw 2-90 pounds. I like that sort of deal. It's also nice to know that we are not the only ones to make big mistakes!

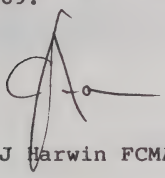
Well that's about it for this time. It has had a fair amount of 'Waffle' in it this time, but I cannot finish without telling you about the launch of Feng Yen-1b. It was probably heard by James Brown first, who told Les Currington of its unexpected frequency. Les received the picture, printed a picture and went with Geoff Perry to the Farnborough Air Show to present to Wang Lu and Si Xuewu on the China Great Wall Industry Corporation stand an example of their new satellite's product.

Further details will no doubt be included elsewhere in this newsletter. Brief details are 137.80 MHz but are transmitted LH circular polarisation that is the opposite to normal, resulting in fadeouts when overhead. Look on page 11 for a photograph of Wang Lu, Les Currington of both the Kettering and Remote Imaging Groups and Si Xuewu. We have been allowed to publish their photo by Geoff Perry who took the photo. Keep up the good work lads!

Best Wishes
Henry.

1989 Accounts statement by accountant

I certify that this financial statement has been prepared from the accounts and records of the Remote Imaging Group and that it represents a true and fair view of the trading, assets and liabilities of the Group as at the 31st December 1989.



C J Harwin FCMA 6th November 1990

REMOTE IMAGING GROUP

Statement of Income & Expenditure

for the Year Ended 31st December 1989.

Expenditure		Income	
A/D	16.36	A/D	228.60
Pre-Amp	637.64	Pre-Amp	107.36
Dish	2474.51	Dish	2293.60
Feed	763.00	Feed	0.00
Receiver	543.96	Receiver	329.27
Misc & Sat Modules	1455.70	Misc & Sat Modules	627.36
Downconverters	1111.34	Downconverters	939.79
Less Stock Increase	(2972.01)		
Total	**4030.50**	**Total**	**4525.98**
Net Income C/Fwd.	**495.48**		
Newsletter Printing	3254.20	Net Income B/Fwd.	495.48
Newsletter Post	1355.00	Subscriptions	5315.86
General Postage	310.33	Back Issues	38.50
Secretarial Servs.	239.64	Adverts	630.00
Rally Expenses	446.12	Commission Rec'd.	684.58
Committee Expenses	10.00	Donations	11.00
Bank Charges	5.19		
Office Expenses	185.00		
Depn of Office Equipt	477.00		
Total	**6282.48**	**Total**	**7175.42**
Surplus of Income Over Expenditure	**892.94**		
	7175.42		7175.42
	=======		=======

Balance Sheet as at 31st December 1989.

Employment of Funds		Funds Employed	
Office Equipt	2385.00	Surplus B/Fwd.	8328.37
Less Depreciation	(477.00)	Surplus for Year	892.94
Stocks - Equipment	6476.00		
Stocks - Newsletters	700.00		
Cash at Bank	134.72		
Cash in Hand	2.59		
Total	**9221.31**	**Total**	**9221.31**
Total Assets	9221.31	**Surplus C/Fwd.**	9221.31
	=======		=======

Les Currington of both the Kettering Group and Remote Imaging Group and Si Xuewu and Wang Lu from the China Great Wall Industry Corporation.

Amigasat - A brief review
by Gordon Fleming.

The ability to make use of signals transmitted from orbiting or geostationary satellites in order to reproduce weather images on a monitor or photographic system depends on some form of memory storage capable of storing this data.

Although framestores were largely used at first it is becoming more obvious that with the decreasing cost of RAM, the ever increasing processing power of home computers and the flexibility this offers to programmers that there will be a natural tendency towards using computers rather than framestores in the future.

The question as to which computer will dominate this particular field of interest to radio amateurs is harder to answer. It depends largely on which particular computer the programmer has available, its dispersal throughout the amateur radio fraternity and the package price of the software.

One particular computer which has only recently been recognised for its more serious computing abilities is the Commodore Amiga. It comes in various models 500-1000-2000-3000 and is priced from as low as 349 pounds up to 3,800 pounds depending upon which configuration suits your pocket.

Amigasat is a weather satellite package which is now available and intended to operate on Amiga computers using Amiga DOS 1.2 and up and will run on models 500-1000-2000 machines regardless of age providing there is a minimum of 1 megabyte of available ram. You will see this package advertised by Martelec on page 66 of RIG newsletter 21 and being offered at a special introductory price of 99 pounds to which you have to add VAT and postage. How long this introductory price will last is not known but if you wish to save money my advice would be to buy now. The price can only go up in view of what is planned for the future.

If you went to the VHF rally at Sandown this year you may have caught sight of the package being demonstrated on the Martelec stand, being an Amiga owner (500) but I must confess not as technically competent in its use as some,

I was immediately impressed by the way its originator Geoff Hatto was demonstrating the packages ability and versatility to display images and modify those images using contrast stretching and adding colour. I asked him to send me details as at the time he and Martelec were only taking orders.

It was in early August when the postman knocked to hand me the package I had ordered, but unfortunately I hadn't by that time got my 137 MHz receiver working so I decided to ask my friend Les Currington to prepare me a cassette tape recording with some NOAA and METEOSAT images on it to test out Amigasat.
There was no point in asking for some Russian images as the introductory package was so new Geoff had not had enough time to develop the decode programme and include them on the disk, but I had been assured that I would not have to wait long and the update would be free apart from postage cost, the Russian decoder is now available.

I could not have picked a better time to ask Les for a test tape because the weather conditions over UK and Europe were ideal and providing some great images, (witnessed on playback of Les's equipment.)

My initial worry was whether the different tape speeds of the recorder Les used and the one I was using for playback would affect the screen image and degrade it. But as I had been reliably informed the sophistication of how the Amigasat did its decoding in software rather than in hardware, synchronising proved to work fine and there was no noticeable effect on the image, other than on one NOAA pass, some slight banding which I understand is caused through the Doppler signal interference and which no doubt in the fullness of time will be taken care of as the software improves, needless to say its not on Meteosat and only shows up on some NOAA passes - the synchronising signal on a separate channel of the tape is not necessary with Amigasat.

What do you get for your money? Well the package comes in a card board box measuring approx. 8" x 6" x 1 1/2", inside of which is a 3 1/2" disk (unprotected) which you are advised to make a backup copy as soon as possible. Also within the bubble film packing is a small plastic box approx 3"x2"x1" which is the hardware interface intended to connect with its 25 pin "D" connector plug (which is at the end of a short length of multiway cable) into your Amiga parallel port.

At the other end of the box is a phono socket into which you introduce your audio signal from your receiver or tape recorder. Finally on the top of the interface box there is a small hole through which you can adjust a trimpot to set the input level in conjunction with your receiver volume control.

I believe at some stage it is intended that this trimpot will be extended to a knob on the outside of the case to prevent those heavy handed users with oversized screwdrivers damaging the trimpot. Don't be put off by the simplicity of the hardware interface, the quality of this package is in its software.

Having read the rather brief introductory notes that came with the package and got everything connected up as advised. I switched on the Phillips 8833 colour monitor, loaded the 3 1/2" disk into drive DF0, and switched on the computer. Within seconds I was presented with a screen which invited me to type in the time and date.

Here is where I came up with my first problem, I could not figure out what I was doing wrong until I realised that the program was looking for me to type in the first three letters of the month (Jan-Feb) etc, having done that I pressed return key and the drive whirred into action loading the program into the computer. When the drive stopped I was invited to use the "drop-down" menus.
(for those who do not know the Amiga, drop down menu's are screen selection boxes with program options which appear and are selected by use of the right hand mouse click down button)

From the drop down menu I selected "sample picture" and this led me into a new screen image giving me further options to :-

1 Select NOAA Meteosat Meteors.
2 Select the number of screen lines from 35 to 512 I wished to display on the screen.

Having selected my options I clicked the OK gadget and then into the final screen before sampling, this screen allows you to set signal levels by indicating to you what percentage your audio level input is, adjustment to your volume control or the trimpot to set your level near to 100% is all that is required before you click in the sample signal box to begin accepting signals into your system, which should have at least 1 Mbyte of memory available. Another feature of the final screen is that it indicates what frequency the software has locked onto around the 2400 Hz carrier of the incoming signal.

With the sample box clicked and a NOAA signal being fed into the interface phono socket you should at this stage now see a picture start to build up line by line on your screen. At this point you have to be patient and wait for the visible and infra red images being stored in the computer memory. You can decide at what stage you which to terminate the input by clicking the left mouse button. But if you are wise, you will at least wait until a full screen has been displayed. The secret is to only record the best part of the pass with the least noise. Although you experience dropout this software has a repair feature and on your final picture you will not see small dropouts.
Click the left mouse button when ready and the screen changes inviting you to save what you have in memory to disk. Here is where having a second drive with formatted disk inserted saves time. Addressing the output to DF1 and clicking the save box immediately downloads the image in memory to this disk.
When the picture is saved to disk you can then click the program quit option and immediately the drive uploads your image to the monitor screen. This time in higher resolution than the image you observed on the screen whilst the program was sampling. This is because while sampling is taking place only a low resolution image is needed. All the time the sampling is taking place the memory is taking in high resolution images at least up to the resolution capabilities of the Amiga computer.

While the picture is being returned to the screen it may need some lateral adjustment. This is easily achieved by clicking the customised cursor to the left edge of the visible or infra red image as it starts to build up on screen. This gives immediate register to whatever image you select.

So far so good. But! If you want to avoid the small problem I had then if purchasing a new Amiga computer get your dealer to allow you to test the output volts between pins 14 and 23 (some Amigas only give 3.5 volts) and you need 5 volts to get the hardware interface to work. This is no fault of the interface really but nevertheless necessary for satisfactory working.
If you already own an Amiga and 3.5 volts is all you can raise across 100 ohm resistor between pins 14 and 23, then you will have to do a small mod to bridge out a resistor inside your computer. If this is done it works, as witness my mod is working, but you will void your Commodore guarantee if you break the computer case seals. The choice is yours but you need not worry if the mod is done competently.

Martelec can advise if you need help. They did help me when I telephoned and even offered to do the mod for me.
Unfortunately Commodore cannot help with serial numbers of Amiga computers that have the low voltage output. You are either lucky or unlucky with your purchase, most Amigas are OK.
Having got that small hiccup out of the way the rest was plain sailing, because, having got my NOAA image on screen I could now go ahead and using my pull down menu's to select various tools and algorithms built into the program which would allow me to delve into all the various picture enhancements routines available.
Some of the things you can do to this screen image are too complicated and lengthy to describe here. Suffice it to say when you have played around with the options available in the program for a while you will soon come to realise the depth of versatility of what the package is capable of (contrast stretching & colour addition). This offers endless possibilities subject to the limits of your imagination. All these image changes can be saved back to a disk for storage and later use or be saved in IFF format for further pixel enhancement within paint packages such as 'Deluxe paint','Pixmate','Photon paint', etc.

'Zoom options', 'interlace for higher resolution still', 'picture inversion' to change N to S passes are other options. Just to wet your appetite Geoff Hatto and Martelec have informed me that for that the in future you can look forward to:-

1 Meteo auto downloading
2 Section plotting and temperature readout
3 More picture filtering, and image enhancement routines
4 Orbital predictions
5 Coastal outlining on orbiter images
6 3D plotting (giving cloud depth as TV weather images)
7 Facsimile

Thats enough to convince me that I was right to choose this package. I look forward to the future updates and hope Geoff and Martelec keep the prices affordable.
I have only briefly eluded to the package. A more technical leaflet and demo disk are available from Martelec. I hope other Amiga owners who have bought this package will put pen to paper and let us know if they to find it as good as I have.I would like to thank Geoff and Chris Pretty at Martelec for providing us Amiga users with an excellent value for money package.

HRPT Receiving Notes
by Matjaz Vidmar, YT3MV

Thank you very much for continuing sending me your nice magazine "RIG Newsletter". I noticed that many of your advanced members are working hard to receive, decode and display NOAA HRPT pictures. Most of them seem not to know even what size of antenna to use, to start with... In this letter I would like to give them some advice, since NOAA HRPT is not really so difficult as it may seem at first glance.

1. Antenna: a 1 meter dish is completely sufficient. Of course it has to be equipped with a circularly polarised feed. A large antenna will only cause tracking problems, while a 1 meter dish can be handled by standard antenna rotators, like KR5600, and its beam is wide enough to tolerate rotator errors.

2. Pre amp: the best available, GaAs, right on the feed!

3. Receiver: a custom built as required...

4. Bit and frame synchronisers: same as above...

5. Data processing: the HRPT data stream is easy to transform to an analogue video signal, even modulated on a 2400 Hz subcarrier. Although some resolution is lost in this way, this is the solution for the first experiments.
The next step is direct digital entry into a computer.

6. Tracking software: commercial software is usually very inaccurate. Write your own software, especially the rotator software!

7. Doppler: although the receiver does not require a Doppler correction, the Doppler shift contains useful information about the satellite orbit. An automatic correction of the orbital elements set can be implanted just as software! This is not a must, but is very useful...

Please find enclosed a short description of my actual NOAA HRPT station, which I intend to manufacture in small series, hopefully in the near future.

Have you noticed the new satellite transmitting APT on 137.800 MHz on 1695.500 MHz? Seems to be a Chinese satellite!
Ed's comment, This would appear to be Feng yun 1b.

YT3MV NOAA HRPT RECEIVING STATION:

Receives full resolution imagery and data from polar orbiting NOAA Spacecraft in 5 spectral channels with 1 KM sub-satellite point resolution. The station includes a steerable parabolic antenna, a HRPT data receiving and a tracking, data processing and display computer.

SPECIFICATIONS:

Antenna: 1m diameter front fed parabolic reflector with built in 100K LNA allows error free reception of both NOAA HRPT channels at 1698/1707 MHz above 10 degrees elevation.

Tracking pedestal: 360 degrees azimuth and 180 degrees elevation rotation allows tracking of all satellite passes including overhead passes.

Receiver: Up to four switchable channels (1698/1707MHz as standard). Includes BPSK demodulator, bit rate synchroniser and bit conditioner, frame synchroniser, computer data interface and Doppler measurement hardware.

Computer: Motorola MC68010 16 bit CPU, 1 Mbyte RAM, 3.5 floppy drive and all required interfaces. Allows instantaneous satellite tracking, antenna rotator control, automatic satellite ephemeris update through Doppler measurement,NOAA HRPT image recording, picture processing and display.

Display: B/W, 521 pixels by 256 lines, 256 grey levels, standard TV compatible.

Software: Multitasking operating system allows concurrent execution of the following software:
Tracking software updates antenna position once per second and stores ephemeris data for 40 different satellites. Algorithm includes short term second order perturbations for accurate tracking and picture gridding.
Doppler correction software measures the Doppler on the satellite signal and compute small corrections to the otherwise quickly aging satellite ephemeris data.

Picture processing and display software allows automatic recording of a selected area, up to 1024 pixels by 800 lines in one spectral channel (with 1 Mbyte of RAM). Independent zooming in both axes is provided, together with grey scale enhancement, picture geometrical correction and automatic superposition of grids and coastline for easy image referencing.

Other features: Raw HRPT data output including bit clock and frame pulses for mainframe data processing.
Processed data also available on floppies (IBM format) or through the RS 232 port.

Custom: Memory up to 15 Mbytes. False colour display. Custom interfaces for any computer/software.

Matjaz Vidmar's observations re Feng yun 1b

New APT & HRPT WX satellite!!

A new weather satellite has been launched recently.
The satellite transmits APT (analogue) pictures on 137.80 MHz and HRPT (digital) pictures on 1695.50 MHz)

Both analogue and digital data formats correspond almost exactly to the American NOAA satellite series, however the same frequencies have been used in the past by a Chinese weather satellite, suggesting a new Chinese weather satellite?

The APT pictures use a transmission standard very similar to the NOAA APT. The 137.80 MHz carrier is frequency modulated by a 2400Hz subcarrier and the subcarrier is in turn AM modulated with the video information. The transmission speed is 120 lpm and even the sync burst frequencies are the same as those used by NOAA: 823Hz and 1040Hz. One image line contains two images taken in different spectra (actually one visible and the other near-IR) and the only difference from NOAA transmission is additional telemetry in the near IR grey scale! APT video quality is worse than NOAA: the signal to noise ratio is lower and there are line to line problems with sync stability: the sync itself is stable, but the image is not.
One possible explanation for this is that two separate sensors are used onboard the spacecraft and only ever second line originates from the same sensor! The APT picture includes a "milkbottle" distortion correction just like NOAA!

The HRPT pictures are transmitted on 1695.50 MHz, RHCP, with the same standard as used by NOAA satellites on 1698 MHz and 1707 MHz : 665.4 kbps PSK digital transmissions, same modulation and sync pattern and same data organisation in the frame!
The channel assignments are however different from NOAA: CH1 and CH2 (apparently the same) visible data. CH3 and CH4 carry (apparently the same) near IR data. CH5 transmits an all 1s pattern, no image data yet. Maybe CH5 will carry thermal IR data after radiometer decontamination? Maybe CH1 and CH2 data (or CH3 and CH4 data) can be combined to yield an even higher resolution than NOAA? The HRPT video data is of very good quality and does not show any of the defects detected on the APT transmissions! Also the signal strength at 1695.50 MHz is comparable if not better than NOAA, allowing an error free reception with an 1 m dish.

The HRPT signal has strong modulation sidebands, allowing a 1698MHz HRPT receiver to lock onto a signal sideband! Hopefully it is not going to disturb Meteosat transmissions at 1694.5MHz and in any case any interference should be limited to less than a few seconds due to the narrow beams of 1.7 GHz high gain antennas.

Her are the approximate Keplerian elements obtained from Doppler shift measurements in just two days of observation These should remain valid for at least a week or so.

Epoch Year	1990
Epoch Day	247.000 days (midnight 3/4 Sept 1990)
Inclination	99.1 degrees
RAAN	281.5 degrees
Eccentricity	0.0
ARGP	290.0 degrees
MA	0.0 degrees
MM	14.012 revolutions/day
SMAX	7265 KM
Frequencies	137.800 MHz
	APT (AM/FM 2400Hz subcarrier)
	1695.500 MHz HRPT (665.4 kbps)

The satellite appears to be in a sun synchronised orbit, slightly higher than NOAA. Due to the almost integer value of MM it appears to be in an almost repeat track satellite.

Any news about the new satellite would be much appreciated!

DARTCOM, DEVON
NOMINATED FOR BCS AWARDS FINAL

The British Computer Society (BCS) announced today, Friday (5-10-1990) the nomination of Dartcom, Devon as one of the eleven finalists of the society's Information Technology (IT) Awards for 1990.

Dartcom's Satellite Image Acquisition and Processing system is the first PC based system which will create high resolution images of satellite transmissions. PC's are a cheap and easy way to process satellite information particularly for organisations strapped for cash such as schools. Because PC image processing for satellite information is relatively poor much of the benefits of PC processing are lost. Dartcom are the first company to produce a desk top system which will overcome these problems.

The finalists come from a wide variety of organisations like Boots Co Ltd, the Royal National Institute for the Blind and the University of London and cover areas of the UK such as Devon Manchester and Kent. This reflects the goal of the awards which is to reach all aspects of IT spectrum.

Three awards are given every year for Social Benefit, Applications and Technical categories.
The finalists are chosen by an independent panel who seek projects which have made an outstanding contribution to IT. The finalists will make a presentation at the Waldorf in London on the 13th of November when the winners' awards will be presented by the Duke of Kent, the Patron of the society and strong supporter of IT.

THE BRITISH COMPUTER SOCIETY AWARDS:

PROJECT	**ORGANISATION**
3D Image Maker.	University College London Dept of Photogrammetry
RNIB Electronic Newspaper System	Royal National Institute for the Blind

EPOS Implementation	The Boots Company PLC
IMPART	IBM
Intelligent Speech Driven Interface Project ISDIP	Hatfield Polytechnic Speech and Language Technology Group
Miranda Functional Programming System	Research Software Ltd (University of Kent)
OPTICS	The Patent Office/ Computer Sciences Company Ltd
Oxford Music Processor	Oxford University/BTG
Satellite Image Acquisition and Processing	DARTCOM
SONATA-CAD for the building Industry	t2 Solutions Ltd
Welfare Benefits Adviser	ICL / Walsall Metropolitan Borough Council
JS/18.09.90/3 MEDPRESS.90	

New boy experiences
by Dennis Carey

My knowledge of electronics can be written on a pin head, but faced with unexpected early retirement, I needed a new interest to replace a life long love affair with gliders, which had come to a sudden end.

The flying had to stop, but I could maintain an interest in meteorology. I already had an Archimedes, with a teletext adapter for downloading telesoftware on CEEFAX, and in the late spring of 1989, BBC 2 were about to start transmitting weather satellite images on a regular basis. I was anxious to down load the software which would be necessary to decode the forthcoming satellite data, but the teletext adapter went on the blink so I had to cast around hurriedly for someone who could download the vital software for me.

To cut a long story short, I ended up at the local comprehensive school where the head of geography had a weather satellite system up and running, and I didn't even know that such things were generally available! A quick demonstration of SATFOOT indicated that nothing was about to pass over, but I was very impressed with the quality of the printouts that had been obtained previously using a BBC micro. I resolved to have my own system and started collecting glossy brochures.

As an end user of electronic hardware I found the new jargon quite baffling. It seem to me that all these miraculous little black boxes were designed exclusively by and for the electronic specialist, and given code names, for the specific purpose of keeping people like myself in total ignorance of their real purpose. What was a downconverter, hornfeed, framestore, YU3UMV GASFET, MOS FET, WXSAT, WEFAX, etc, etc ? Fortunately, an excellent little book by Chris Hornby came through the post, which clarified a lot of questions. The main problem to emerge was the choice of a suitable receiver, and weather to go for the orbiting or geostationary satellites. I chose the former, because I couldn't see how I could obtain an acceptable level of resolution for my purpose, with the latter, from the information available in the brochures.

With no independent expert to advise me, I was completely at the mercy of whatever was promoting a particular product.

This is not a satisfactory situation and no reflection on any particular person or product, but with a lot of cash at stake, I dithered for several weeks before taking the plunge. I had by now joined Rig and opted for the Rig receiver on the grounds that they had no particular axe to grind ! for the acquisition board there was only one choice for the Archimedes and that was the spacetech podule.

The equipment arrived and all I needed, apparently, was an N type connector to get the signal into the receiver, which my local TV man supplied, while marvelling at my abysmal ignorance. Attaching it to the aerial feed however, was an other matter, which required a lot of patient practice with a soldering iron.

Bearing in mind that I had never actually seen an Archimedes system working or heard the now familiar "tick tock" of an orbiting NOAA, I was some what surprised and delighted when a recognisable picture of remarkable clarity started to form on the screen. With the benefit of hindsight, I must have been extremely lucky, or perhaps it was a case of fools rush in? My biggest problem arose when I moved the equipment into another room and discovered EMI.

In my total ignorance of this subject I had located the receiver immediately next to the computer, because both the space available and length of input lead provided did not permit any other arrangement. Quite fortuitously this arrangement had worked beautifully, but not any more.

The podule went back to Spacetech and the receiver to Dartcom, the aerial went up and down like a yo yo, all leads and connections were checked, rechecked, and remade, all to no avail. No image at all, just noise, with the "S" meter jittering all over the scale. The problem apparently, was in the computer. All those chips getting hot and bothered right in the middle of the satellite frequency band. I also learnt about pagers and car phones, neon tubes, and many other nasty things that cause EMI.

I invested in mains filters, soft iron torroids, a longer screened input lead, arranged and rearranged the equipment, and all that tangled cable on the floor, until eventually the problem was bought under some sort of control and a picture began to re-emerge on the screen. Entirely by trial and error, accident or pure chance, with out doing anything more constructive than fiddling with the wires, the image quality and footprint area slowly improved until I could clearly

recognise Cape Farewell, North Cape, Cyprus and Madeira but not all at once! The biggest improvement occurred when I moved everything close to a large metal radiator and then tucked the aerial and the input leads down the back, but I still do not know why it had all worked so well initially, in the room next door.

Having ironed out most of the bugs in the system, I could not take a more serious look at what was going on down there on the earth, and I found that the resolution of the system, as I had anticipated was quite capable of revealing a small scale meteorological features of particular interest to the glider pilot. There are four way of staying up by gaining height in raising air on a long distance cross country flight, and these can all be seen on a cloud scan if you know what to look for.

On a good soaring day, with a light wind and low humidity, thermals are distributed with an average spacing of about 5 times the depth of the convective layer. For example, if the cloud base is at 5 to 6 thousand feet, there will be a fairly uniform distribution of small white clouds spaced about 5 or 6 miles apart.

Around the coast line, typically 10 to 20 miles inland, a line of cloud can frequently be seen where cool air coming off the sea meets and undercuts the warm air rising inland. This is the famous sea breeze front that marks a continuous line of lift which can be exploited by a pilot without having to circle.

In a stronger wind of 10 to 15 mph, thermals will tend to roll up in rows parallel with the prevailing wind direction, to form continuous lines of lift marked by lines of cloud about 5 to 10 miles apart. These are called cloud streets, which may extend downwind for a hundred miles or more.

If the temperature gradient in the atmosphere is greater than abut two degrees C. per 1000ft, then conditions exist for cumulus clouds to grow vertically to altitudes of 30,000 ft or more.

These clouds can be best seen in the late afternoon and early evening, when normal thermal activity has declined, as isolated cumulonimbus-nimbus casting long shadows across the countryside.

Another way of flying cross country or achieving great altitude in a glider, is to exploit the standing waves which occur quite frequently over more mountainous areas, generally in stronger winds and anti-cyclonic conditions.
Standing waves can also been seen as parallel lines of cloud, but laying across the prevailing wind direction or aligned with major features on the ground. Sometimes they form into a distinctive herring bone pattern, which may extend over several hundred miles.

I was now able to receive data for up to 15 minutes on a good pass a meteor series satellite, which is close to the theoretical limit for an unobstructed horizon, and much better than I ever expected. This results in the beginning of a pass being overwritten after 1200 lines, due to the limited memory capacity of the A310. I could see the advantage of increasing the memory when a second satellite followed close behind that I did not;t have time to look at the first one, so I up graded the memory to 2Mbytes.

With an extra Mbyte of memory available I could now store another 1800 lines making a total of over 3000 lines or 25 minutes of data. Unfortunately, this had the side effect of generating more noise from twice as many chips-and shrinking my footprint area down to zero! I was back at square one, but still receiving a very good signal on an over head pass, as indicated by a full scale deflection on the "S" meter, but the lines were not synchronising properly.

During this phase I learnt a lot more about how to manipulate the Spacetech software, with it's various facilities for altering the sync pulse threshold, pixels/grab, post-trigger delay and so on but none of this improved the picture quality significantly. It was back to rearranging the wires again raising the aerial a bit further and fiddling with the soft iron torroids.

Most of the time, the "S" meter would jitter continuously all over the place and ,only settle down for a few minutes on a strong signal from an over head pass. I thought it was the microwave, as I had not previously encounter very much external interference where I live, in the Lake District, but no domestic gadgets were operating. After an hour or two, the wildly fluctuating noise level would subside to near zero, and I began to get an acceptable picture again from an overhead pass; but why should this happen? Russian satellites seem a lot better in this respect, presumably because they radiate more power ?

By judicious wire fiddling, I managed to recover about half of the footprint area that was obtained before upgrading the memory, but I could not be certain that poor synchronisation would not recur, even on an overhead pass. I was not convinced, at this stage, that the problem was due entirely to computer generated noise and not caused partly by a rising level of interference from pagers and car phones, even in my own rural backwater. So I waited for the late night satellite passes to arrive, when captains of industry should be asleep, but there was no improvement.

The next step was to see if a masthead pre-amplifier would improve the situation. While waiting for this to arrive, out of curiosity I moved all of the equipment about 12 inches away from the radiator, and noticed a small but significant reduction in jittering, with an improvement in both footprint area and the picture quality. This was quite inexplicable as previously, before the memory upgrade, this had made things worse! Inspired by even a modest success, I moved everything about ten feet into the centre of the room and found that I reduced the correlator threshold, I could recover more of the lost footprint area and get a reasonable picture.

It could not stay there, in the middle of the room, my wife said, so a compromise was reached up against the wall three or four feet from the offending radiator.
The Spacetech software had a facility to examine the signal level, and it was obvious that the pulse amplitude of the computer input was very much reduced from previous levels. Not being an electronics enthusiast, I don't have an oscilloscope to examine the amplitude at the receiver, and long distance telephone discussions are not the best way of trying to resolve such a complex technical problem. However Dave Wright of Dartcom and Chris Hornby of Spacetech were very helpful, sympathetic and understanding. I began to suspect the phono input socket as one potential cause of trouble," send it back " said Chris and we will have a look at it.

By the time it came back I had the pre-amp up , but it didn't work, even though it was getting it's 12.5 volts up the coax. The computer noise problem however seemed to be beaten at last, but still no picture. This time the receiver came under suspicion. Can you record the signal ? suggest Nigel. How do I do that ? said I, eager to learn. Well it's like this .....and while you are at it send a piece of coax and we'll check the impedance.

I recorded a NOAA and METEOR using a portable radio, and played them back through the computer; lo and behold, I got a picture! Evidently, both receiver and computer were O.K. and the suspicion now fell on the input leads of which I had two sets, both of which had faults as I quickly discovered with my new multimeter, and were quickly replaced.

To your average expert enthusiast this must all seem very obvious and rather tedious, but this is exactly the way it happened. Evidently, eliminating interference and capturing small signals is an art, rather than a science, in which the necessary skills are acquired only after a long, arduous, and frustrating apprenticeship. If at first you don't succeed then persevere!

There is a message for manufacturers in all this. If you want to sell your equipment to a wider non specialist market, it has got to be a lot more idiot proof. I most certainly would not put up with all this nonsense to get my TV to work.

It would be very helpful if some general principles and guide lines could be set down in these columns by experts, for the benefit of the uninitiated; and for other readers to describe their own experience with other computers and receivers. From my own point of view this would be a lot more interesting than a long technical dissertation on how to design, build, test, the latest reciprocation wobulator,or what ever.

Now that the system is running again, but without the pre-amp at present, it would also be very interesting to be able to deduce surface temperatures, and other parameters, from the grey scale values. Does anyone know how to do this, and if so, could they please get in touch ?

Watching satellite images in the comfort of my own home is as close as I shall ever get to flying in the worlds most expensive glider-the NASA SHUTTLE, and I never cease to be fascinated as the world unfolds before my very eyes, by courtesy of RIG and it's many helpful members.

Dennis Carey,
Haverthwaite,
Cumbria.

METEOR MANOEUVRES - EARLY HISTORY

GEOFF PERRY MBE
THE KETTERING GROUP

The letter from Lawrence Harris in RIG Newsletter No.21 pp 61-62, implies that orbit corrections of Meteor spacecraft are something of a novelty. Your readers may be interested in parts of an account I wrote for the United States Committee on Commerce, Science, and Transportation which deals with this subject (ref 1).

It may be helpful to remind your readers that the Soviet Union did not refer to the original series as Meteor 1 and do not number individual spacecraft within each series. Certain satellites, given the Meteor designation at launch, were identified as 'experimental'. The 18th Meteor was the first of these and the 25th Meteor, was also referred to as Meteor-Priroda (Nature). The 28th Meteor was the first to be placed in a retrograde Sun-synchronous orbit and, with the 30th and 31st Meteor, was a precursor of the Cosmos 1500 - Okean satellites.

The technique of plotting mean motion against epoch to detect orbital corrections was used extensively at Kettering in 1974, when two-line orbital elements were first received on a regular basis. Extracts from the Senate report are given below:

The tenth Meteor was used to test ion-plasma electrojet engines which use solar energy to create thrust by means of plasma accelerated in electromagnetic fields. The Russians announced that these orbital correction engines were developed to guarantee stabilising capability for flights of long duration (ref 2). Also for the first time, it was possible to change the orbital attitude of the satellite by 16.9 km. The higher orbit allowed improved scanning of the Earth's surface and increased the accuracy of the geographic tie-in (ref 3).

The 28th Meteor was placed initially into an orbit with a period of 97.46 minutes at heights ranging between 600 and 670 km. In this orbit the ground-track came close to repeating itself every fourth day after 59 revolutions but could not be regarded as ground-track stabilised. After three months in this orbit the apogee was lowered and the resulting orbit between heights of 600 and 660 km had a period of 97.32 min. This was ground track stabilised with repetition of tracks every fifth day after 74 revolutions.

A study by Anthony Taylor at Kettering Boys school showed that the orbital period then decayed naturally to 97.29 min., by February 25, 1978, causing the five day pattern to drift eastward at a rate of 0.5 degrees per cycle. Corresponding transits were coming some 35 seconds earlier at each cycle. Another correction, raising apogee by only 2 km. stabilised the ground track once more.

Reference to these manoeuvres, using a stationary plasma engine with an average thrust of 0.2 to 0.5 N, which had been flight tested during the 1973-74 period, was made in a 1981 review article (ref 4). A technique was created and worked out for making optimal (with respect to time and energy consumption) corrections for the purpose of establishing repeated orbits, in connection with the developers determined the optimum strategy for alternating active periods when the correction engines were turned on and passive ones when orbital measurements were being made. In one experiment, a repeating Sun Synchronous orbit with a five day repetition period was established.

The article went on to say that a matter of considerable interest for the solution of remote sensing problems is the establishment of not simply a repeated orbit, but one for which the spacecraft passes over a given region with a given periodicity. It claimed that in one experiment, possibly the same as observed by Taylor, this ,was accomplished with the accuracy of track guidance over the required region being 5 to 10 km for a daily repetition period.

References:

1 In SOVIET SPACE PROGRAMS: 1976-80 (WITH SUPPLEMENTARY DATA THROUGH 1983), U.S. Government Printing Office, Washington D.C., May 1985.

2 Andronov, I., "The Meteors are on Watch. " Moscow, Pravda, May 25, 1972, p.3.

3 Artsimovich, L.A., et al. "Development of a stationary Plasma Engine (SPE) and its Testing on the Meteor Artificial Earth Satellite." Moscow, Kosmicheskiye Issledovaniye, 12, 1974, pp. 451-568.

4 Trifonov, Y.V., Issledovaniye Zemli iz Kosmosa, 1981, pp.8-20.

This Primary data image from Meteosat has been produced by Bob Sansoni and reproduced on Sony Video printer. The receive system was developed by Bradford University.

THE SOVIET AND CHINESE SATELLITE SCENE
by Les Currington, G8LOK

Two years ago during the Farnborough Air Show on the morning of the 7th of September the first signals where received of a new Chinese Weather Satellite Feng Yun 1, but after only a few days it started to tumble and was eventually switched off. It was then announced that it would be at least two years before a new launch would take place.

It is no coincidence that for several days during the 1990 Farnborough Air show a careful watch was made on the 137.00MHz and 137.8 MHz band for signs of a possible launch. On the evening of the 3rd September a phone call from James Brown said that signals were being received on 137.8 MHz at 19.18 hrs of a new Chinese Satellite. At 7.41 gmt on the 4th of September I received a full pass but with very severe fading at the point of nearest approach, however it was not long before reports where coming in from Dr Bjortorp in Norway and Malcolm Purvis in Bristol that they where receiving the new Chinese Satellite.

It is my first impression that the Satellite may be using LH Polarisation or that the fault could be an aerial obstruction?. However it was possible to print out a full pass on the 4th September showing the severe fading at about 50 deg. latitude.On the 5th September I was able to show the print to Wang Lu the general Manager of the Chinese Space division during my visit to Farnborough with Geoff Perry. Wang Lu was pleased to hear that a successful launch had taken place.
It is hoped that I will be able to receive and show in a latter RIG a picture received from the Chinese space Division possible of China itself.

After several days of transmission showing the two visible channels, a change was made during the weekend of the 23rd of September when pictures were transmitted in both IR and Visible. The early morning pass of 7.50 GMT is not the best time slot for the winter months, also the frequency at present used 137.8 MHz will at some time in the future be clashing with one of the Meteors which are not on a Sun-synchronous orbit. Although with the 50 kHz separation it should be possible for most members to escape any interference.

Several reports have been received of an Okean type transmission on 137.27 MHz. Lawrence Harris of Plymouth suggested it was from Cosmos 1602 after running through all the old Okean type Keplers; maybe an extra strong command signal to another Satellite switched on the old bird out of a deep sleep after being in a period of long sunlight?
Malcolm Purvis of Bristol reported a pass with a visible picture showing the Kent and Dutch coastline on 12/10/90; this is the first report of pictures from 1602 since switch on.

A report by the World Meteorological organisation states that the Meteor 2 series of Weather Satellites will be discontinued after 1990, so possibly Meteor 20 was the last launch of that series. It was also announced that one Meteor 3 series Satellites will be launched each year to give 2-3 Meteors in service at any one time.

Transmission status as at 16 Oct 90:

Please note that due to frequent changes of frequency the Meteor transmissions could be on 137.85 or 137.3 MHz.

Meteor 2-18 137.30 MHz

Normal transmissions were seen on the early morning pass until loss of signal at the terminator. By the middle of November it should be appearing in a late afternoon descending orbit.

Meteor 2-19 137.30 MHz

No transmissions have been heard since early July on the VHF bands ,this does not rule out the fact that other systems may be in operation.

Meteor 2-20 137.30 MHz 1990-86a

On 28/9/90 a Meteor 2-20 was launched; on 29/9/90 a phone call to Geoff Perry from Geoff Wallach in the USA stated that a new Meteor was transmitting on 137.3 MHz. On the evening of the 29/9/90 I received a IR transmission but at the point of maximum signal strength the transmission was switched off. At the time of writing no more transmissions have been heard.

Are we now seeing orbit storage as used by the USA for their Transit Navigator Satellites which are stacked under their SOOS program (Stacked Oscar on Scout program).?

Meteor 3-2 137.85 MHz

Normal visible transmissions were received until reaching the terminator when it switched to IR during a late afternoon ascending pass.

Meteor 3-3 137.30 MHz

Very erratic transmissions have been seen from this Satellite with severe streaking and varying black level, at the time of writing no signals have been heard for several days.

Okean 2 137.40 MHz

Several reports of transmissions in both Radar and Visible pictures, certainly well worth keeping track of.

Feng yun 1-B (Wind and Cloud) 137.80 MHz

Launched from the Tai Yuan launch site by a Long March 4 into near circular Sun-synchronous orbit. Numerous reports where received of the very weak signals and severe fading of Feng Yun, after receiving several pictures and noting the position of each fade it was decided that the transmissions where from a LH polarised source. Reports have been received from Dr Bjortorp in Norway and Birger Lindholm in Finland, all reporting severe fading.

A LH polarised aerial was constructed and all transmissions are now received at normal signal strength.

A picture from Feng yun is shown on the centre page of this RIG newsletter.

The Feng yun 2 series of Geostationary Satellites will be launched in the early 1990s.

KEPLER ELEMENTS
provided by Max White - Kettering Group

	NOAA 9	NOAA 10	NOAA 11
	137.62 MHz	137.50 MHz	137.62 MHz
	84-123	86-73	88-89
EPOCH OF DATA	90298.23505248	90294.56796487	90299.14701505
ACCELERATION	0.00000586	0.00000630	0.00000748
REV NO.	30234	21259	10744
INCLINATION	99.1738	98.5870	98.9979
R. A. NODE	301.1358	319.6404	247.6918
ECCENTRICITY	0.0015292	0.0012480	0.0011203
ARG OF PERIGEE	7.8070	260.8550	276.4180
MEAN ANOMALY	352.3335	99.1217	83.5721
MEAN MOTION	14.12709957	14.23770079	14.11769700

	MET 2-16	MET 2-17	MET 2-18
	137.85 MHz	137.30 MHz	137.30 MHz
	87-68	88-05	89-18
EPOCH OF DATA	90296.17514607	90296.84809589	90296.56433264
ACCELERATION	0.00000220	0.00000239	0.00000191
REV NO.	16068	13798	8332
INCLINATION	82.5597	82.5411	82.5149
R. A. NODE	188.8538	248.1662	126.1906
ECCENTRICITY	0.0010891	0.0016292	0.0015376
ARG OF PERIGEE	255.1548	328.9419	9.2945
MEAN ANOMALY	104.8430	31.0779	350.8487
MEAN MOTION	13.83691209	13.84380948	13.84020350

	MET 2-19	MET 2-20	OKEAN 2
	137.85 MHz	137.30 MHz	137.40 MHz
	90-57	90-86	90-18
EPOCH OF DATA	90296.85121379	90297.05141222	90295.87193363
ACCELERATION	0.00000322	0.00000115	0.00002942
REV NO.	1631	356	3487
INCLINATION	82.5507	82.5261	82.5282
R. A. NODE	186.5395	125.6903	340.1047
ECCENTRICITY	0.0014814	0.0012426	0.0018355
ARG OF PERIGEE	290.3553	178.0898	217.4220
MEAN ANOMALY	69.5985	182.0312	142.5700
MEAN MOTION	13.83870228	13.83232957	14.73667591

	MET 3-2	MET 3-3	FENG YUN 1B
	137.30 MHz	137.85 MHz	137.80 MHz
	88-64	89-86	90-81
EPOCH OF DATA	90296.66591068	90296.56670929	90295.73666992
ACCELERATION	0.00000067	0.00000052	0.00014859
REV NO.	10786	4783	696
INCLINATION	82.5472	82.5545	98.9341
R. A. NODE	186.5334	127.4796	329.3289
ECCENTRICITY	0.0017997	0.0017260	0.0010789
ARG OF PERIGEE	355.7685	11.0156	123.6816
MEAN ANOMALY	4.3307	349.1376	237.1018
MEAN MOTION	13.16903213	13.15866511	14.00532270

Reference Orbits for Russian Satellites supplied by Dick Boardman

These are the times of north going equator crossing (in GMT) and longitudes (in degrees west) for three Russian satellites.
They are given at weekly intervals together with the period and the change in longitude per orbit.

MET 2-20
period 104.16 minutes increment 26.04 degrees

10NOV	4:40	7	17NOV	3:20	359	24NOV	3:44	17	1DEC	2:24	9	
8DEC	1: 3	2	15DEC	1:27	20	22DEC	0: 6	13	28DEC	22:46	5	
4JAN	21:26	357	11JAN	21:50	15	18JAN	20:29	8	25JAN	19: 8	0	
1FEB	19:32	18										

MET 2-19
period 104.11 minutes increment 26.02 degrees

10NOV	8:21	5	17NOV	6:55	357	24NOV	7:14	16	1DEC	5:49	8	
8DEC	4:24	1	15DEC	4:42	20	22DEC	3:17	12	29DEC	1:52	4	
5JAN	0:26	357	12JAN	0:45	16	18JAN	23:20	8	25JAN	21:55	1	
1FEB	22:14	19										

FENG YUN 1B
period 102.87 minutes increment 25.71 degrees

```
10NOV  21:11  19 17NOV  21:13  20 24NOV  19:32 355  1DEC  19:33 355
 8DEC  19:35 355 15DEC  19:37 356 22DEC  19:38 356 29DEC  19:40 357
 5JAN  19:42 358 12JAN  19:43 358 19JAN  19:45 358 26JAN  19:47 359
 2FEB  19:49 359
```

MET 3-3
period 109.49 minutes increment 27.37 degrees

```
10NOV   4:58   8 17NOV   4:51  18 24NOV   2:55   1  1DEC   2:49 11
 8DEC   2:41  21 15DEC   0:45   4 22DEC   0:39  14 28DEC  22:42 356
 4JAN  22:35   6 11JAN  22:29  16 18JAN  20:32 359 25JAN  20:25 9
 1FEB  20:19 19
```

COMING SOON IN THE DECEMBER ISSUE WILL BE:

- Maurice Wigg on framestore construction
- More from Dr. Bjorn Bjortop
- A 2400 Hz detector from Colin Schulz
- An Archimedes system review by John Wedderburn
- Les Hamilton on OKEAN II
- plus all your usual favourites !!

A SURVEY OF FAX and APT DECODING SOFTWARE AVAILABLE FOR DIFFERENT COMPUTERS.
by Peter Dobson

In RIG 21 I looked at software available for the IBM/PC. This list was, of course, not exhaustive and since publication (late as it was) of RIG 21 I have, with help from a number of sources, found software available for the following computers:

Acorn Archimedes, Atari ST, BBC, Commodore Amiga, Commodore C64, and a couple more for the IBM/PC.

A lot of this information has come from the latest issue (Issue 10 - June 1990) of a book that I can highly recommend called "Guide to Facsimile Stations" by Klingenfuss. Hagenloher Strasse 14, D-7400 Tuebingen, Germany. If you go to him directly you can buy the publication for 50DM. It has been mentioned in the past in RIG magazine. There are several other publications in the set covering wider horizons.

I have written to each of the companies/groups listed below and so far have only received one reply, this from Technical Software. As a result I am unable to provide much information on some of these products as yet. However, by including addresses of all products I trust you will be able to obtain more information directly if the product sounds interesting.

I have not had time, this quarter, to update my last article in RIG21 but I will try and do this for the winter edition of RIG.

Archimedes 310.

Space Tech, 21 West Wools, Portland, DT5 2EA.
This software is quite well known and adverts for it can be found elsewhere in this magazine.

NOAA '10' PERIOD 101.19494 MINS INCR 25.299 DEG

1/12 188 07:51	29/12 354 18:55	28/01 332 17:24	26/02 340 17:57
1/12 340 17:58	30/12 348 18:32	29/01 351 18:42	27/02 183 07:27
2/12 182 07:28	31/12 342 18:08	30/01 345 18:19	27/02 334 17:34
2/12 334 17:35	1/01 185 07:38	31/01 188 07:48	28/02 354 18:52
3/12 353 18:53	1/01 337 17:45	31/01 339 17:55	1/03 348 18:29
4/12 347 18:29	2/01 331 17:22	1/02 182 07:25	2/03 342 18:05
5/12 190 07:59	3/01 350 18:40	1/02 334 17:32	3/03 185 07:35
5/12 342 18:06	4/01 345 18:16	2/02 353 18:50	3/03 336 17:42
6/12 184 07:36	5/01 187 07:46	3/02 347 18:27	4/03 331 17:19
6/12 336 17:43	5/01 339 17:53	4/02 190 07:56	5/03 350 18:37
7/12 330 17:20	6/01 181 07:23	4/02 342 18:03	6/03 344 18:14
7/12 355 19:01	6/01 333 17:30	5/02 184 07:33	7/03 187 07:43
8/12 350 18:38	7/01 352 18:48	5/02 336 17:40	7/03 339 17:50
9/12 344 18:14	8/01 347 18:25	6/02 330 17:17	8/03 181 07:20
10/12 186 07:44	9/01 189 07:54	6/02 355 18:58	8/03 333 17:27
10/12 338 17:51	9/01 341 18:01	7/02 349 18:35	9/03 352 18:45
11/12 332 17:28	10/01 183 07:31	8/02 344 18:11	10/03 346 18:22
12/12 352 18:46	10/01 335 17:38	9/02 186 07:41	11/03 189 07:51
13/12 346 18:22	11/01 354 18:56	9/02 338 17:48	11/03 341 17:58
14/12 188 07:52	12/01 349 18:33	10/02 332 17:25	12/03 183 07:28
14/12 340 17:59	13/01 343 18:09	11/02 351 18:43	12/03 335 17:35
15/12 182 07:29	14/01 185 07:39	12/02 346 18:20	13/03 354 18:53
15/12 334 17:36	14/01 337 17:46	13/02 188 07:49	14/03 348 18:30
16/12 354 18:54	15/01 331 17:23	13/02 340 17:56	15/03 343 18:07
17/12 348 18:30	16/01 351 18:41	14/02 182 07:26	16/03 185 07:36
18/12 190 08:00	17/01 345 18:17	14/02 334 17:33	16/03 337 17:43
18/12 342 18:07	18/01 187 07:47	15/02 354 18:51	17/03 331 17:20
19/12 184 07:37	18/01 339 17:54	16/02 348 18:28	18/03 351 18:38
19/12 336 17:44	19/01 181 07:24	17/02 190 07:57	19/03 345 18:15
20/12 330 17:21	19/01 333 17:31	17/02 342 18:04	20/03 187 07:44
21/12 350 18:39	20/01 353 18:49	18/02 184 07:34	20/03 339 17:51
22/12 344 18:15	21/01 347 18:26	18/02 336 17:41	21/03 181 07:21
23/12 187 07:45	22/01 189 07:55	19/02 330 17:18	21/03 333 17:28
23/12 338 17:52	22/01 341 18:02	20/02 350 18:36	22/03 353 18:46
24/12 181 07:22	23/01 184 07:32	21/02 344 18:13	23/03 347 18:23
24/12 333 17:29	23/01 335 17:39	22/02 186 07:42	24/03 189 07:52
25/12 352 18:47	24/01 330 17:16	22/02 338 17:49	24/03 341 18:00
26/12 346 18:23	24/01 355 18:57	23/02 181 07:19	25/03 183 07:29
27/12 189 07:53	25/01 349 18:34	23/02 332 17:26	25/03 335 17:36
27/12 340 18:00	26/01 343 18:10	24/02 352 18:44	26/03 355 18:54
28/12 183 07:30	27/01 186 07:40	25/02 346 18:21	27/03 349 18:31
28/12 335 17:37	27/01 337 17:47	26/02 188 07:50	28/03 343 18:08

All morning passes are southbound, evening passes are northbound.
Frequency 137.50MHz. INCRement is degrees change per orbit.

NOAA '11' PERIOD 102.0455 MINS INCR 25.50 DEG

1/12 352 13:47	31/12 343 13:15	29/01 183 02:41	1/03 348 13:51
2/12 350 13:36	1/01 187 02:52	29/01 336 12:54	2/03 345 13:40
3/12 347 13:25	1/01 340 13:04	30/01 334 12:42	3/03 190 03:16
4/12 344 13:13	2/01 185 02:40	31/01 331 12:31	3/03 343 13:28
5/12 188 02:50	2/01 338 12:53	1/02 353 14:02	4/03 187 03:05
5/12 341 13:02	3/01 182 02:29	2/02 350 13:51	4/03 340 13:17
6/12 185 02:39	3/01 335 12:41	3/02 347 13:39	5/03 184 02:53
6/12 338 12:51	4/01 332 12:30	4/02 345 13:28	5/03 337 13:06
7/12 182 02:27	5/01 354 14:01	5/02 189 03:04	6/03 181 02:42
7/12 335 12:40	6/01 352 13:50	5/02 342 13:17	6/03 334 12:54
8/12 332 12:28	7/01 349 13:38	6/02 186 02:53	7/03 331 12:43
9/12 330 12:17	8/01 346 13:27	6/02 339 13:05	8/03 353 14:14
9/12 355 13:59	9/01 190 03:03	7/02 183 02:42	9/03 351 14:02
10/12 352 13:48	9/01 343 13:16	7/02 336 12:54	10/03 348 13:51
11/12 349 13:37	10/01 187 02:52	8/02 333 12:43	11/03 345 13:40
12/12 347 13:25	10/01 340 13:04	9/02 330 12:31	12/03 189 03:16
13/12 344 13:14	11/01 184 02:41	10/02 353 14:02	12/03 342 13:28
14/12 188 02:50	11/01 337 12:53	11/02 350 13:51	13/03 186 03:05
14/12 341 13:03	12/01 181 02:29	12/02 347 13:39	13/03 339 13:17
15/12 185 02:39	12/01 334 12:42	13/02 344 13:28	14/03 183 02:53
15/12 338 12:51	13/01 331 12:30	14/02 188 03:05	14/03 336 13:06
16/12 182 02:28	14/01 354 14:01	14/02 341 13:17	15/03 333 12:54
16/12 335 12:40	15/01 351 13:50	15/02 185 02:53	16/03 330 12:43
17/12 332 12:29	16/01 348 13:39	15/02 338 13:06	17/03 353 14:14
18/12 355 14:00	17/01 345 13:27	16/02 182 02:42	18/03 350 14:02
19/12 352 13:48	18/01 190 03:04	16/02 335 12:54	19/03 347 13:51
20/12 349 13:37	18/01 343 13:16	17/02 332 12:43	20/03 344 13:40
21/12 346 13:26	19/01 187 02:52	18/02 355 14:14	21/03 188 03:16
22/12 190 03:02	19/01 340 13:05	19/02 352 14:02	21/03 341 13:28
22/12 344 13:15	20/01 184 02:41	20/02 349 13:51	22/03 185 03:05
23/12 188 02:51	20/01 337 12:53	21/02 346 13:40	22/03 338 13:17
23/12 341 13:03	21/01 181 02:30	22/02 190 03:16	23/03 182 02:53
24/12 185 02:40	21/01 334 12:42	22/02 343 13:28	23/03 335 13:05
24/12 338 12:52	22/01 331 12:31	23/02 187 03:05	24/03 332 12:54
25/12 182 02:29	23/01 354 14:02	23/02 340 13:17	25/03 355 14:25
25/12 335 12:41	24/01 351 13:50	24/02 184 02:53	26/03 352 14:13
26/12 332 12:30	25/01 348 13:39	24/02 337 13:06	27/03 349 14:02
27/12 355 14:00	26/01 345 13:28	25/02 182 02:42	28/03 346 13:51
28/12 352 13:49	27/01 189 03:04	25/02 335 12:54	29/03 190 03:27
29/12 349 13:38	27/01 342 13:16	26/02 332 12:43	29/03 343 13:39
30/12 346 13:27	28/01 186 02:53	27/02 354 14:14	30/03 187 03:16
31/12 190 03:03	28/01 339 13:05	28/02 351 14:02	30/03 340 13:28

All morning passes are southbound, afternoon passes are northbound.
Frequency 137.62 MHz. INCRement is degrees change per orbit.

For sale, any reasonable offers considered:

1 x Atari 1040STFM computer with additional external 1Mb drive, Philips CM8833 Hi-res colour monitor, wide-carriage Epsom compatible dot matrix printer. (All about 12 months old)
1 x Timestep 'Atari' interface, with software, documentation and grey scale convertor (for colour monitors)

2 x Timestep colour Framestores, fully operational.
1 x Timestep 10 channel receiver.
2 x Philips monitors (one B/W, one green-screen).
2 x B/W monitors (ex - security camera, oldish, fiver each?)

1 x Amstrad PCW9512 with daisywheel printer/sheet feeder, 2nd drive fitted, expanded internal memory (1mb ram), internally fitted fan, Logitech mouse, serial/parallel interface, screen filter, extra daisy wheels, printer ribbons, loads of good software, spare disks & reference books.

Contact Chris Kaley on 0895 446096 (West Drayton)
(Always interested in anyone who wants to ring and talk satellite!)

Atari ST.

Afusoft,
Postfach 21 13; D-7535 Konigsbach-Stein 2, Germany.
Hardware + Software, 960 pixels resolution by 16 shades. (The same hardware unit is used on their IBM/PC version described below.) Capable of decoding APT and FAX input, but I don't know whether it will cope with signals from tape. The advertised resolution is a little odd as this is beyond the capability of the Atari ST!! Price is 400 DEM.

BBC.

Technical Software, Fron, Upper Llandwrog, Caernarfon, LL54 7RF.
RX-8 MULTIMODE RECEIVE SYSTEM. (£259.00) Hardware + Software,
Software is supplied on a 16K eprom. Allows FAX, Packet Radio, RTTY, SSTV, Morse, Simtor/Amtor, Uosat and Ascii processing. Meteosat, NOAA, and Meteor reception is achieved by using the APT-1 module (£59.00) which converts these signals to Fax format that can then be used by the RX-8 software. The capabilities of the software package are very full.

Martelec Satellite Systems.
8 Kimbers Lane, Farnham, Surrey.
GU9 9PT.
BBC Graphstore consists of an external frame store driven by the BBC from a programme provided on a 16K ROM. The external frame store provides 512x512 with 256 shades of grey. Picture synchronisation is sorted out by software. Zoom and hardcopy are provided (also works on the BBC-master.)

BBC-B and Master.

David L. Bird, G6EJD, 22 Beech Avenue, Melksham, SN12 6JP.
Software on a floppy disc or cassette and a decoder unit is provided for £50. No details of spec. are available.

Amiga.

Karl Edensberger, DF8CJ, Fallhofstr 11, D-8068 Pfaffenhfen, Germany.
HAM-FAX AMIGA. for 200DM. It provides 1024 pixels by 16 shades of grey to a dot matrix printer. covers scan frequencies from 60 to 240 RPM and IOC of 288, 352, 576. There is also an APT mode available. Although not stated I suspect some form of interface unit to the Amiga is required at extra cost.

Geof Hatto,
Martelec Satellite systems, 8 Kimbers Lane, Farnham,
Surrey. GU9 9PT.
AMIGA-SAT. This programme runs under Amiga DOS, provides all decoding and timing from software. Decodes the Meteosat picture with digital header, and uses the digital header as the file name. Also decodes NOAA and Meteor both from tape and live. Stores to disc either as a full resolution binary file or in IFF format. Provides zoom, contrast enhancement and advanced edge processing. A dongled interface unit is provided with the package £99.00

ICS Electronics Ltd,
Unit 5, Rudford Industrial Estate, Ford,
Arundel, West Sussex BN18 0BD.
This programme comes with a hardware interface unit. It uses the internal Amiga clock and therefore cannot be used from a tape source. Some Amiga clocks on older Amigas have been found to be incorrect for this software. The software does not run under AMIGA DOS and takes over the machine from KickStart. Hardware interfaces to demodulated APT, ie baseband. APT demodulator or FAX discriminator must be provided separately. James Brown reviewed this product in RIG 16. Hardware and software £99.00

Spectrum.

Technical Software.
Fron, Upper Llandwrog, Caernarfon, Gwynedd LL54 7RF.
Provides high resolution pictures to an Epson dot matrix printer. The software deals with FAX input but can accept APT using their APT-1 module. FAX programme with SIA-2 interface unit £40.00. APT-1 adaptor £59.00

Commodore C64.

Karl Ebensberger DF8CJ
Fallhofstr 11, D-8068 Pfaffenhofen, Germany.
Provides a screen resolution of 320x200 pixels or 960 pixels per line when output to an Epson dot matrix printer. Covers scan frequencies of 60 to 240 RPM and IOC of 144, 288 and 576. Can also store pictures to floppy disc. Hardware and software cost 160DM.

IBM/PC.

Aufsoft,
Postfach 21 13, D-7535 Konigsbach-Stein 2, Germany.
RADIOFAX-PC, consists of hardware and software. Offers 800x600 pixels on a monitor or 960 pixels per line on an Epson dot matrix printer. Both support 16 shades of grey. 400DM.

Eberhard Backeshoff DK8JV,
Oberschwarzbach 40a, D-4020 Mettmann, Germany.
FAX/SHOWPIC. is freeware available for 30DM. It covers line frequencies from 48 to 240 RPM and IOCs of 288, 352 and 576. Automatic nonstop recording on an Epson dot matrix printer is possible at 960 pixels per line. Image storage/retrieval and zoom is also possible.

Chip-Express,
Andreas-Herz-Str. 3, D-8011 Baldham, Germany.
SUPRA PC FAX, software and hardware is available for 300DM.
No other details available.

Ulrich Neuber, DL3ZAS, Reichshofstr. 123, D-5840 Schwerte, Germany. ZORNS LEMMA. Reception programme is available for 70DM. Covers 60 to 240 RPM. Offers 640x350 pixels on a monitor or 960 pixels on an Epson dot matrix printer. Automatic and manual picture synchronisation is provided.

PGD. October 1990.

Want to buy a VGA card John ?
by Dave Cawley
Timestep Electronics LTD

The author was prompted to write this article by an unfortunate incident at the PC Users show in London. Seeing an attractive IBM PC VGA video card at a very low price, I asked what it did. "VGA graphics" was the unhelpful reply. "OK what is it's maximum resolution", "1024 by 768" the man said. Well, with only 256K on board this was clearly impossible ! I took another tack, "what is the maximum resolution in 256 colours ?", "1024 by 768" replied the man in a by now annoyed tone, and of course even more impossible. After further enquiries he simply walked away from me ! Let the buyer beware, or be completely ripped off ?

Actually this extreme case is almost copied by some very respectable manufactures. The standard VGA mode of 640 pixels and 480 lines will give 16 colours. The other standard mode is 320 pixels 200 lines and 256 colours. Put this into a not very creative marketing man and it will come out as "up to 640 x 480 in up to 256 colours". Notice that it doesn't actually say 640x480x256 ?

As some RIG members are aware, images displayed in extended VGA of 800x600 in 64 greys or 256 colours are amazing detailed. Framestore's with 256x256 in 64 greys are now rather old hat. Add the ability to store, zoom, animate and print images and it is easy to see the way forward.

Of course for serious weather satellite users, 16 colours or greys are not of much real use, hence the plethora of extended VGA cards. Even here there are problems. The new IBM model 30-286 proudly boasts that it has an old type AT bus, allowing existing cards to be used. Nowhere though do IBM tell you that video cards are specifically excluded ! You are stuck with the good (?) old IBM VGA. The ATARI PC4/5 is quoted as having standard VGA, but in fact most have Paradise chips fitted giving 640x400x256, far better than the 320x200x256 Atari quote.

The number of colours are often confused with the number of greys. In most 16 colour modes, 16 greys are available. In most 256 colour modes 64 greys are available (not always though). 64 greys and or 256 colours are fine for all applications, coupled with an intelligent software system this can give you; 30 (or more) blues for the sea,

30 (or more) greens for the land, 30 (or more) browns for high ground and all the 64 greys for cloud cover on a good visible light image from NOAA or Meteosat.
Some weather satellite software falls into the same marketing trap mentioned above, 640x480 and up to 256 colours. But by now you know what this means, if not read the above again ! Other systems will in fact operate in higher modes but only on very specific cards, not much use if yours is not supported. Timestep (suppliers of the RIG system) have every known video card on the shelf and actively supports them all ! Their offer is that if your card is not supported (very unlikely) they will write a driver specially for it, if you send them the card and technical manual. Harvey Wilkins, a RIG member of course, did this recently and to his delight now has 800x600 in 256 colours on his never seen before ZyMOS board.

Monitors can be a problem. To resolve 800x600 properly requires a 0.29mm dot pitch maximum monitor. 640x480 or 400 can just (only) get away with a 0.31mm. Some so called high resolution VGA monitors have a dot pitch of 0.42mm. Check also that white does not bloom the display. For text applications they may be fine, put up an infrared Meteosat image with lots of white in space and they won't be so good. Also watch out that a Multisync may not have a very good resolution, even though they must be used for 800x600. Specs are all very good and impressive, but use you own eyes to judge finally.

Computers are another minefield. Both the new Amstrad's and the Atari PC4/5 have Paradise graphics as standard and support 640x400 in 256 colours. This is fine for most users. For running SDSP (software digital signal processing) applications, a 286 (or better) is essential. So basically if you want to run the RIG NOAA software buy a 286. Beware though there are 286's about with 8 bit expansion buses, very cheap, very fast and impossible to upgrade. Speed is another bone of contention, for most applications a 386 and maths co-processor is simply not required or beneficial. Only very specific applications such as Lotus 123 will use a co-processor. Far more important is Hard Disc speed, often quoted but rarely bothered with. Try loading a full resolution Weather Satellite image on a 286 with a fast hard drive. Try it again on a 386 with co-processor and slow disk, got 5 times more time to spend ??. So given the choice spend your money on disc, not processor performance. NOAA HRPT is coming, disc speed is of paramount importance, processor speed is not for this application.

So what does the confused RIG member do ? Don't hurry, look at all the specs carefully, evaluate precisely your current and future needs, and talk to other computer users (not necessarily RIG members).

Dave replies to the Peter Dobson's PC-SAT review in RIG 21:

Since Peter Dobson first looked at our system (PC-SAT III) there have been several significant changes. These are listed below:

All software is now supplied as standard including VGASAT, ANIMATE, NOAA and now OKEAN. (editors comment: the Animate software has been extended further with a special version for 286 and 386 machines. It includes accurate timing based on the system CMOS clock, edge enhancement and improved field selection within frame).

The Trident video card is now fully supported.

A HP Laser printer dump has been included.

The interface and software is only available from RIG

As Peter mentions, the picture quality is indeed stunning, this is because we display 256 colours not 64. We don't throw away any data. It is stored on disc so that the zoom facility will show all the detail the satellite transmits.

The summary has a few errors, these are:-

Adjust palette is 256 colours out of 262,144 colours!

We do support slicing in the set colour routine

We now support hard copy.

Animation is up to 64 frames, but watch this space!

The signal source can be live or from tape. The tape feature we think is unique. It will allow even OKEAN images to be loaded from tape without a sync track. Doppler correction is also included.

We believe it is more important to display as much of the image on the screen as possible rather than maintaining an absolute aspect ration. There seems little point anyway bearing in mind the inherent distortion produced by projecting a spherical surface (the Earth) onto a flat surface (monitor screen). Actually most monitors have sufficient adjustment range to provide true aspect ratio if required anyway.

There are a few points not mentioned that are very important.

It is important to quote the displayed resolution as well as the stored resolution. After all there is no point in storing all the data if you cant see it! We store 600 pixels, 800 lines and 256 intensity levels. We can display 800 pixels, 600 lines, and 256 colours all on the screen at the same time. We also support every known VGA card in all modes.

Finally we fully support, Meteosat, GOES, NOAA, Meteor and OKEAN as standard. Beware that all of them are subtly different. The good old framestore would probably do the all. We know of one system that will receive Meteosat but puts it upside down on the screen! GMS has a subtly non-standard phasing signal, when the new GOES series is receivable it will relay GMS.
We believe that we have the best and most comprehensive system. We are not standing still though. Any new software will always be compatible with our existing hardware.

Dave Cawley
Managing Director ~ Timestep Electronics Ltd. 23 June 1990

CENTREFOLD PICTURES:

This editions centrfold pictures have been provided by Les Currington (Feng Yun 1b) and the University of Dundee via the Rev. James Brown. The Dundee image was taken way back in May 1980 and is stunning HRPT example of the UK on a good day!. The picture from Les is from the recently launched Chinese satellite which I understand is very similar in construction to the US series of NOAA satellites.

Many members have asked how these pictures are produced, answers on page 46.

Automatic Recording of Weather Satellite Images with a DAT Recorder by Stephen C Padar.

It is well known that weather satellite images can be recorded on audio tape and later played back to yield images almost like images recorded directly from the receiver. This is a great convenience since most of us have to work and cannot be at home to start and stop the equipment. Fortunately, it is fairly easy to make unattended recordings. The Dartcom receiver has a built in relay that is closed when the squelch is open. This can be used to start a tape reorder. When the squelch closes, the relay opens and the recorder stops. The telemetry data is recorded on one track of the audio tape and 2400 Hz sync tone is recorded on the adjacent track. When the recording is played back, the telemetry data and sync track are locked together because they are physically on adjacent portions of the tape. Thus, any variation of the tape speed is cancelled out and a satisfactory image results. The image is not perfect, however, since frequently, a slight jitter is present which causes a minute saw tooth like distortion at the edges of the image. There are also horizontal streaks in all the pictures caused by particles of the tape coming loose and adhering to the tape head. This problem has been discussed previously in this publication.

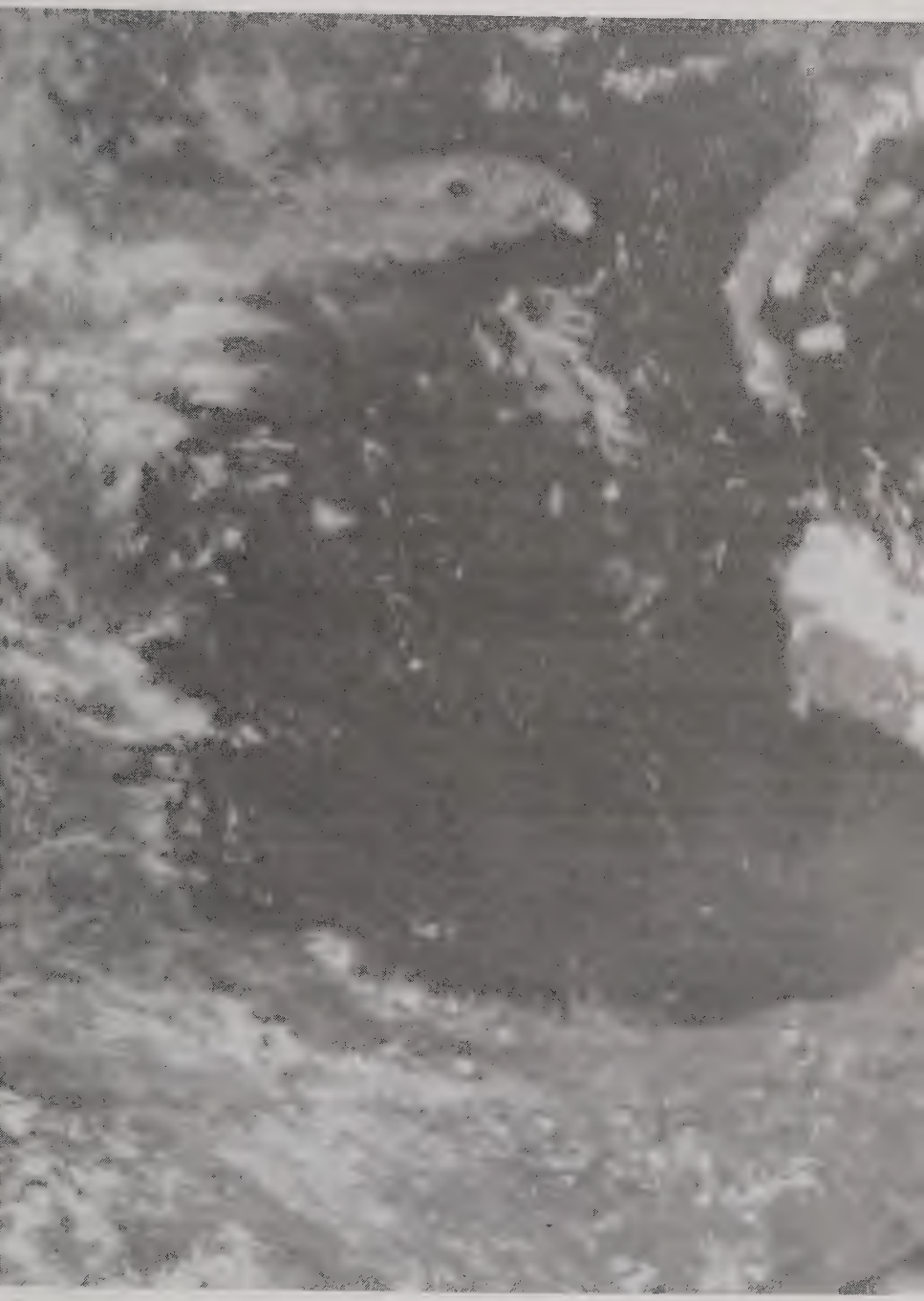
Ed's note:
A copy of one of Stephens pictures is reproduced on the next page. Due to our printing processes the differences between the off-air picture and one reproduced from the DAT medium (both supplied to RIG) would be negligible.

How are our centrefolds printed?? (contd.)

Both Les Currington and James Brown have very similar printing systems.

They comprise essentially of solid drum to which photographic paper is attached. The drum rotates in synchronisation with the image lines being sent from the satellite. ie if the satellite is working at 2 lpm then the drum will rotate at the same speed.

contd on page 51



A MINIATURE METEOSAT RECEIVER
by Barry Haines, G6FAT

Now having a computer system as well as the YU3UMV framestore I am able to receive both METEOSAT on the computer and orbital satellites on the framestore. To receive METEOSAT I use a LMW downconverter for 1691MHz to 137.5MHz which is fed to a R7000 with tunes 137.5 & 141MHz to give me CH1 & CH2.

While considering designing a dedicated METEOSAT rx I was introduced to the MOTOROLA MC3362 ic I saw the possibilities and blackmailed the chief buyer at work to acquire a sample for me. The MC3362 consists of two mixers and a limiting amplifier with quadrature detector and can operate up to 450MHZ with an external LO of >100mV rms. I made up a prototype board see with the signal applied direct to pin 1 via a tuned circuit, the output of the first mixer passes through two 10.7MHZ 50KHZ scan filters to the second mixer. The output from the second mixer about 455KHZ goes to a 3SK88 mosfet amplifier with a double tuned output set for about 20KHZ passband. The recovered video signal is passed to a OP-AMP bandpass filter.

As ELMETECH are not using NICAM digital stereo yet the audio amp for monitoring is just a one transistor amplifier driving a broadband cheap transducer. The LO consists of a two channel crystal oscillator using crystals in the 44MHZ band and with the collector tuned to 126MHZ.

As MET-3 is back on with its grotty signal and the fact I have a 70FT feed to the shack I found by sticking a 3SK88 preamp in front of the ic gave perfect pictures. To keep costs down and its novelty I mounted the PCB and preamp etc in an old 2oz tobacco tin (well thats my excuse).

I don't know the cost of the ic but I believe its only a couple of quid anyway you should get change out of 20 pounds.

SPACETECH WEATHER SATELLITE SYSTEM
by Barry Haines, G6FAT

This is a hardware and software package for the Acorn Archimedes series of computer workstations.
The package consists of an I/O podule and two disc's containing the software. The podule has a D connector for remote control of the receiver and a phono socket for the satellite signal.
The software consists of two packages, one for METEOSAT and the other is a FRAMESTORE for polar orbital satellites.

METEOSAT ANIMATION PACKAGE

This has two modes, an extended animation and a high resolution mode. These are similar in that they have three mouse driven screens. The first is the command screen which allows disc access for loading & saving of palette, setup parameters and frames etc. There are three parameters that can be adjusted, the first being the sync level and this should be adjusted for optimum synchronisation of the frame. The next two are the black and the white bias controls, these have the affect of changing contrast and brightness. By adjusting these controls you can highlight coastline or concentrate on dense cloud formations, I found by reducing the black and increasing the white levels I got rid of the lines on MET-3. Once the optimum settings have been found these can be saved and forgotten about. There is a digital filter that can be used to remove streaking when playing back from a tape-recorder but you do loose some definition. The next screen is the timetable screen this is where you can select the frames you wish to capture. This screen is made up of three pages, two displaying the 24hr schedule for channel 1 and channel 2 and the last page is the map of the area seen by METEOSAT and is divide up by the regions covered by each frame. A frame is selected by positioning the mouse over the frame designation and clicking select. You may also select an autoprint function that will dump the frame after capture to the printer. The last screen is the RUN screen and this is were the frame is actually displayed. On the right-hand side is what can be describe as a grandfather clock which show current palette, animation speed and at the top the time. The clockface has a mark for each of the frames already in memory and dragging the pointer around allows you to select each frame. There is a zoom facility that allows you to zoom in on any part of the frame but this must be set up before data is captured.

The main differences between the high and extended modes are that the high resolution is in mode 15 (640*256 in 256 colours) and the extended is in mode 12 (640*256 in 16 colours). The extended mode takes advantage of the fact that the land on the frame never changes so this is loaded on to the run screen as a fixed backdrop and by adjusting the black and white bias only the thickest cloud is captured and thus reducing the amount of data stored thus a larger number of frames can be animated.

There is a utilities package supplied to make backdrops and timetables as well as convert frames into sprites.

FRAMESTORE PACKAGE

This software can receive not only METEOSAT but the polar orbital satellites such as NOAA and METEOR. As this software can run in either mode 15 (640*256 in 256 colours) or 21 (640*512 in 256 colours) you will need to allocate 320k of screen memory. This package runs as an application and can be installed more than once but you will have to allocate sufficient memory for each framestore.

Data collected is stored in a buffer the size of which is determined by the size of machine and memory allocated. On entering the application you start with the run screen which can be considered as a window on the buffer were on the right hand side the current palette is displayed with a dynamic menu. The first four functions move the screen up, down, left and right. The next function will start or stop decoding and the remaining functions select decoding parameters and allow adjustment. Their are nine parameters in all that affect capture and levels etc which I will not discuss in this article as you need really to see the effects and for most of the time once these have been set and saved probably will not need to be changed again. Clicking the menu on the mouse will bring up another menu again on the right hand side of the screen. The top one being VIEW allows you to display the full buffer as a strip down the left hand side and from this you can determine how much more information can be captured before overwriting. Then next function Full screen shows the full width of the satellite data and this is followed by a selection of ZOOMS. A palette option allows you to set your own palette in either colour or monochrome. The IMAGE SYNC determines how you will sync on image data and generally you would use the automatic sync as this works on all the satellites and is the only one that can be used for the Soviet METEOR satellite. You can select pass direction so the display is the right way up, ie travelling N to S or S to N.

The next group is UTILITIES and these give you disk access to load and save setups, data and palettes, add text to the display ie add city name etc. You can also select to enter OS commands such as structure a disk to save data on. Their is also a make sprite facility to allow you to transport images to art packages. The final facility is a marker function which affects the way the mouse is dragged on the screen. The first is ZOOM which will take a rectangle which has been determined by dragging the mouse while holding select and zooming out to the size of the screen. This gives a very powerful zoom function and can make the satellites pixel data look like big blobs. A histogram function will give a histogram of intensity between two points. The last function is AREA DEFINE and this will bring up a sub-menu that allows you to define an area that can be saved or moved left or right which is very handy if there was poor triggering, you can also remove noisy lines or copy nearby good line onto noisy lines. At this level you can flip the screen in both X and Y which is very useful if you have collected the image data in the wrong direction.

CONCLUSIONS

The price of £299 is comparable to that of a hardware framestore with a fraction of the facilities. I had intended to buy the AMIGA system till I saw this one, in fact I bought the package first and then my 410. My only regret is I wish I had bought a 4 Mbyte machine in stead of the 2 Meg. Although the Archimedes costs more than your ST or PC this is a 32 bit system that will leave the others standing (typically 5 times faster than the ST).

How are our centrefolds printed??

Continued form page 46

Along the length of the drum a traverse is used which carries a light source and lens system.
The light source is a glowmodulator tube which is modulated by the incoming signal. The light passes through the focussing lens assembly onto the paper. The traverse is driven by a stepper motor which increments the position of the light source along the drum at the start of each line. Special settings are used when the system is processing an image from NOAA where there are two images sent side by side. Contd on page 65.

A SUMMARY OF RUSSIAN SATELLITE CHANGES
by Lawrence Harris

I don't know where you draw the line between an article and a letter but I enclose the results of several hours analysis done on a sunny day when I should have been out with the family.

I have maintained a record of satellite frequencies and times for some years now and it occurred to me that it could be summarised if merely listed the changes and dates, so I have re-examined my log book to produce the enclosed list which refers only to the Russian wx satellites with Fengyun added out of interest!

It shows the normal operating frequencies that each of the satellites identified has been used in the past, and it teaches me a few things! Firstly I got into the habit of assuming that I would remember a frequency and so there are many occasions where I didn't log it. Fortunately I usually did within a few months and so I have learnt the lesson!

The sequence shows how the various satellite have changed frequency or been switched off from time to time. There is undoubtedly a reason for the "off" periods and many coincide with "twilight" orbits- those were the satellite was travelling near the terminator on both northbound and southbound passes.

On at least two and probably three occasions I believe I was the first person to receive signals from newly operational satellites (despite RIG articles) and I suspect that I may have been an early observer of several of the frequency changes. As an example I wonder how many others spotted the short period when NOAA 9 was transmitted on 137.50 MHz ??

So what you may wonder, is the purpose of all this? Well I was interested to produce for my own use a summary list of the satellites showing at a glance what frequencies have been used by particular satellites and how often they are switched off.
Secondly, should we be thinking about a "hot line" for club announcements? On certain occasions I have rung people to enquire whether any one is aware of an imminent launch (of which I often give details) or a frequency change and the answer is usually negative.

I first raised this point two years ago with one RIG member but he appeared to take an unusual attitude towards enthusiastic amateurs however surly this is important to RIG members?
Perhaps the committee could consider how one might operate so that important changes can be circulated at a minimum cost eg one phone call.

At the moment of writing my latest logging is the re-operation of Met 2/18 which I noted this weekend. Recently we have seen Fengyun 1 (2) start operations and of course Cosmos 1602 came back on albeit with out much to show us! The "quarterly " magazine is not really able to keep us up to date except to record the events as having happened and I am sure Les feels a certain frustration at the inevitable delays before publication happens.

The column that I write in short wave magazine can sometimes be as much as six weeks late, as happened with Fengyun 1 (2) which started operation two days after the press deadline passed. However whereas SWM has started a hot line it is a commercial venture costing the user 33 pence per minute and I think that we could operate something rather more cheaply what does the committee think?.

Lawrence Harris.

Eds Note:
We mistakenly ommitted the all important graphs from Lawrence's previous article. These have now been reproduced following the tables for the current article above.

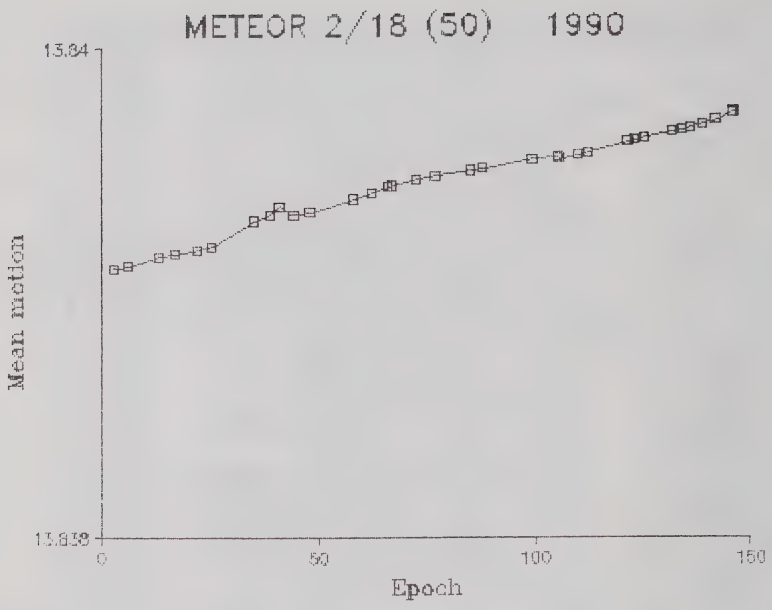
SUMMARY OF RUSSIAN WEATHER SATELLITE FREQUENCIES
COMPILED FROM LAWRENCE'S LOG BOOK - 1986 TO 1990

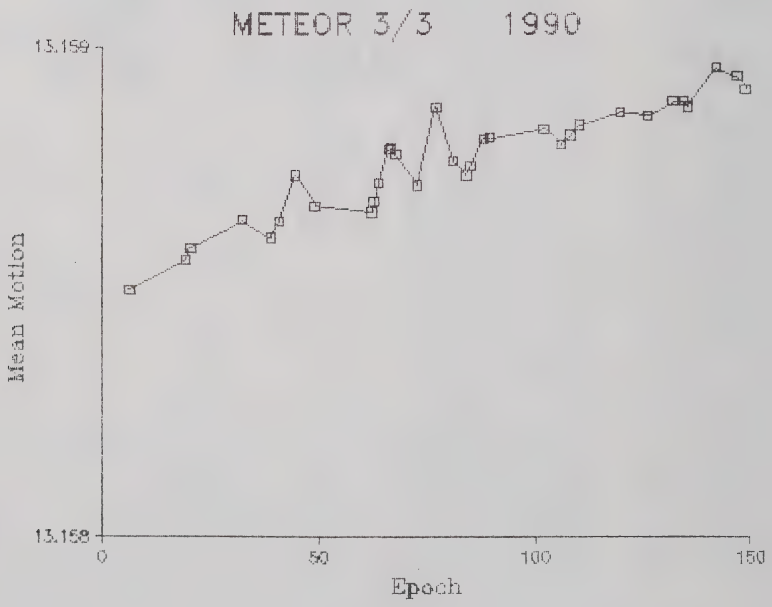
SATELLITE FREQUENCY			DATE/TIME	IDENTITY
	137.40		22.11.86 1837UT	Unknown
		137.85	21.12.86 1006UT	Unknown
	137.40	137.85	various dates	Unknown
137.02			04.01.87 1125UT	Met 30
	137.40		10.01.87 1307UT	21 bars
	137.40		10.01.87 1517UT	16 bars

various observations logged on each frequency (ie 137.02, 137.40 and 137.85MHz) but i/d unknown to me because no predictions program or Kepler elements available.

	137.40		23.02.87 1857UT	Cosmos 1766
	137.40		more observations	C 1766
			28.02.87 (rec)	Met 2/14
		137.85	21.03.87 (rec)	Met 2/14
		137.85	06.04.87 1948UT	Met 2/15
			04.05.87 1650UT	C 1809
		Off	23.05.87 1524UT	Met 2/14
		137.85	06.06.87 1427UT	Met 2/14
	137.40		25.07.87 1514UT	Unknown (new)
	137.40		13.08.87 1220UT	C 1869
137.30			18.08.87 1630UT	Met 2/3
	137.40		19.08.87 (rec)	Met 2/16
	137.40		20.08.87 1711UT	Met 2/16
137.30			04.02.88 1216UT	Met 2/17
		Off	18.03.88 1735UT	Met 2/14
Off			19.03.88 1607UT	Met 2/17
136.98			09.04.88 1153UT	Met 3C
137.30			12.04.88 1841UT	Met 2/17
137.30			07.05.88 1001UT	Unknown
		Off	07.05.88 1645UT	Met 2/15
137.34			10.05.88 1832UT	C 1602
		137.85	25.05.88 1705UT	Met 2/15
	137.40		14.07.88 2032UT	Okean
		Off	02.08.88 0750UT	Met 2/15
		137.85	14.09.88 ? (rec)	Met 3/2?
		137.85	16.08.88 1148UT	Met 3/2
	Off		22.09.88 1625UT	Met 2/16
		Off	24.09.88 0927UT	Met 3/2
		137.85	27.08.88 (rec)	Met 3/2
[137.06			29.09.88 0854UT	Fengyun 1]
	137.40		02.10.88 1234UT	Met 2/16
[137.04 off			23.10.88 overnight	Fengyun 1]
137.30			27.10.88 1715UT	Met 2/17
	Off/On/Off		--.10.88	Met 3/2
			09.11.88 1727UT	Met 2/17
		137.85	22.12.88 1547UT	Met 3/2
	137.40		14.02.89 0852UT	Met 3/2
	Off		--.02.89	Met 3/2
		137.85	09.03.89 1719UT	Met 3/2
137.30			09.03.89 1911UT	Met 2/18
	137.40		20.03.89 2043UT	Met 2/17
	Off		23.03.89 1100UT	Met 2/16
		Off	01.04.89 1207UT	Met 3/2
	137.40		11.04.89 1629UT	Met 2/16
		137.85	16.05.89 0908UT	Met 3/2
Off			29.05.89 1820UT	Met 2/18

137.30		13.06.89	2112UT	Met 2/18
	Off	22.06.89	1755UT	Met 3/2
	137.85	12.07.89	1931UT	Met 3/2
Off		28.08.89	1621UT	Met 2/17
137.40		04.09.89	1638UT	Met 2/17
	Off/On	--.10.89		Met 3/2
Off		22.10.89		Met 2/16
	137.85	25.10.89	2114UT	Met 3/3
	Off	27.10.89		Met 3/2
137.40		11.11.89	1627UT	Met 2/16
Off		18.11.89	0900UT	Met 2/18
137.30		14.01.90	1633UT	Met 2/18
	Off	12.02.90	2205UT	Met 3/3
	137.85	19.02.90	1410UT	Met 3/2
137.40		08.03.90	1120UT	Okean 2
Off		11.03.90		Met 2/16
Off		13.03.90		Met 2/17
137.30		02.04.90	0714UT	Met 3/2
Off		03.04.90		Met 2/18
	137.85	07.04.90	1122UT	Met 2/16
137.30		19.04.90	1637UT	Met 3/3
Off		19.04.90		Met 3/2
	137.85	30.06.90	1312UT	Met 2/19
Off		04.07.90	1853UT	Met 3/3
137.30		05.07.90	0709UT	Met 3/2
	Off	07.07.90	0903UT	Met 2/16
	137.85	31.07.90	2049UT	Met 3/3
	Off	01.08.90		Met 2/19
137.30		04.08.90	1015UT	Met 2/17
137.40		14.08.90	1846UT	Met 3/3
137.30		15.08.90	1624UT	Met 3/3
	137.85	18.08.90	1344UT	Met 3/3
137.28		01.09.90	0912UT	C 1602
[	137.80	03.09.90		Fengyun 1(2)]
137.30		16.09.90	0951UT	Met 2/18
Off		16.09.90		Met 2/17


METEOR 2/18 (50) 1990
13.84
13.839
Mean motion
0
50
100
150
Epoch


METEOR 3/3 1990
13.159
13.158
Mean Motion
0
50
100
150
Epoch

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DEMONSTRATION FACILITIES by RIG Secretary

As a result of recent demand I have set up a facility at my home location in Leighton Buzzard in BEDS where RIG members can come, by appointment, to look more closely at the new Timestep PCSAT III package and Dartcom's PC based display system.

The PCSAT III functions are covered on page 72.

The Dartcom components represent building blocks of bigger systems which have not previously been made available as individual items. The systems are being sold into the professional and educational markets where kit type solutions are not appropriate.

contd on page 70

How are our centrefolds printed??

Continued form page 51

The quality is achieved by the fact that there is no loss of detail due to A-D and D-A processing. The inbound signal from tape or live source goes directly to the light source. Marciano Righini in Italy has a similar system but has the added advantage of being able to output form a PC stored images via an D-A converter to the photographic printer. We hope to print details of this system in a future issue.
At the end of the image the photographic paper is removed and processed in the normal way.

I'm sure this half hearted description of the printing system will encourage the developers to write a more detailed description for a later issue.

Phil Seaford

MEMBERS LETTERS:

Ian Cousins VK5IK
22 Ward Street
Eudunda
South Australia 5374
AUSTRALIA

Fri 18 May 1990

Dear Phil,

Can you, or any of your readers, enlighten me?

Does JESAUG really exist, or is it a cruel hoax, intended only to part me from my money?

On 15th July 1989, I sent a request for subscription information to JESAUG, c/o G. Mengell, at 2685 Ellenbrook, Rancho Cordova, CA 95670, U.S.A., by airmail, and included a $US5 note.

Some while later, I received the information and remitted the balance of the funds by international bank cheque.

I have heard nothing more. The money has been transferred but neither receipt nor Journal have been seen. After waiting five months, I sent a letter, requesting advice, accompanied by an SAE with US airmail postage attached. It produced no response. A later letter, containing coarsely worded threats, intended to give the broadest possible offence, has also been ignored. This is the first known failure of my ultimate subscription reconciliation method.

It is impossible not to draw comparisons with my experience of RIG. While browsing through a cupboard full of Continental "gentlemens' magazines" at the home of a G4 friend, I found an RSGB list of contacts for special interest groups. A fiver to Henry produced a personal note, a number of most interesting back issues and enrolment on the subscription list. Subsequent renewals have been completely without problems.

I wonder if my enthusiasm for Weathersat reception would have survived if my initial contact had been with JESAUG.

The RIG editor replies:

Greg Mengell was indeed the correct person to send funds to in order to receive the JESAUG newsletter that he produced. However control of the journal has now been passed to Jeff Wallach who together with others has formed the Dallas Remote Imaging Group (DRIG). The DRIG distributes its information via a BBS system based at Jeff's location. The BBS is very extensive and includes software and lots of images from various sources. Most of the images are maintained in Compuserve's .GIF format which is starting to become more popular in the UK.

As I understand it Jeff still intends to continue publishing the JESAUG newsletter but I'm not sure at what intervals. Only two issues have been published so far, the second issue received here on 1 Nov 1990 comprising editions 2 & 3.

We have a sharing scheme between the two organisations whereby relevant JESAUG articles may be reproduced in the RIG newsletter and vice versa.

Jeff may be contacted at:

JESAUG Editorial Office
P.O. Box 117088
Carrollton
Texas 75011 - 7088
USA
Tel. Voice 214 394 7325 DRIG BBS 214 394 7438

MEMBERS ADS:

WANTED

MUFAX COURIER 6401 TRANSCEIVER
Technical manual or any other information required. Would also like to hear from any member who has put this machine to WEFAX/SATELLITE use.

M. Levers
'Waverly', Independent Hill, Alfreton, Derbyshire, DE5 7DG.

WANTED
Telecopier 400 paper, does anybody know of a source of this paper, please advise me or the RIG editor so that it may be published.

Colin Schulz
Dept. Posts & Telecoms
APIA
Western Samoa

For Sale
64K Timestep WXSAT Framestore,
as new condition, Composite and RGB output
Push button facility controls for Geostationery satellites and orbiters.
Professional Construction
£250 ono
Derek Billingham, G3FKD, Tel 0384 287125 after 7pm

For Sale
DARTCOM satellite decoder and colour boards as used in the RM Nimbus computer. The unit has been modified to allow a reference signal for the Russian Meteor satellites to be used if required. Contrast mouse is included. £100 per board (originally cost more than that!!)
Lawrence Harris, 0752 775148 (Plymouth)

For Sale
Meteosat Dissemination Schedule program to run on PC or compatible computer using DOS 3.3 or higher.
This program takes the Meteosat Schedule and puts it into a form by which you can select times and picture types without looking through a long list. The program will also produce printouts of the data if required.

DEMO version is free issue
FULL version is £25.00

Postage and packing is 0.80p on each item
Program can be supplied on 3.5" or 5.25" diskettes
Please ring for details: Tel 0462 684764
David Rogers, 10 Longmead, Letchworth, HERTS. SG6 4HW

For Sale
Colour Amiga 2000
includes 2 hard discs: 20 Mbyte internal and 50 MByte external (SCSI), can be sold without external hard disc if required.
Colour monitor and sound digitiser included
Also includes software:

Lattice C (developers version)
Sculpt-3D
Lattice utilities

Reasonable offers considered

Contact Henry Balen, 0223 316060 evenings or 0954 780926 daytime

For Sale or Exchange for Weather Satellite receiving equipment:

1. BBC-B with Cumana drive, 40 or 80 track switch selectable
   25" Monitor
   All software on disk
   Included or will sell separately: Cirkit WXSAT interface, built and working but not in box.
   Software includes UNILAB Weather-Pack1 and SATPACK1-Orbital prediction program.

2. A quantity of 8 RGB monitors, very large but very good resolution 25" screen in metal cases.

3. Microwave Modules Fastscan TV transmitter & Receive converter, rf sniffer and antenna.
   Complete fast scan TV setup.

4. Two Dragon Computers, 64k and 32k memory
   Double disk drives
   Super DOS E6 by G4BMK Packet and Amtor on ROM cartridge
   Also PKT, AMTOR, RTTY, CW, ASCII on disk.
   All controllers leads and connections, loads of software, in fact two complete data stations.

5. TELEQUIPMENT dual trace Type D43 scope, old but working.

6. SE/LAB's Dual trace scope, 18 MHz
This scope has an inverter so it can be run on 24v or mains.
Very good scope especially for the field service engineer.

7. Printer: TANDY DMP100
Works at 600 or 1200 baud, serial or Centronics.

Contact David Bird, GI4XIR,
198 Ashmount Gardens, Hillhall Estate,
Lisburn, Co. Antrim, BT27 5DB, N.I.
Tel 0846 674154, evenings preferred

DEMONSTRATION FACILITIES by RIG Secretary

contd. from page 65

The components are:

VHF APT receiver, professionally cased and featuring:
- Mains power supply
- AFC to bridge the 10 kHz steps
- Dual switched inputs ('N' type sockets)
  - for VHF and Meteosat use
- Full frequency display
- Signal Strength Meter
- Meteosat channel select built-in
- Automatic IF frequency selection when using Meteosat

£397.75

VHF APT receiver, as above, plus
- 2 bit computer control allowing the remote selection of NOAA channels and Meteosat Channels 1 & 2

£447.50

Acquisition board for PC and compatibles, featuring:
- Full length board incorporating:
  - Full APT signal filtering/conditioning
  - Electronic level setting for A-D process
    - controlled by mouse and on-screen graphics
- Comphrehensive manual and dongle

£723.00

For more details contact Phil Seaford on 0525 384419

RIG HELPLINES:

General Enquiries & PCB Supplies
Phil Seaford 0525 384419

NOAA info. Henry Neale 094 585 353

Russian, Chinese satellite info/status
Les Currington 0707 326058

Schools/ Educational enquiries,
Meteosat status and Colin Hall School 021 778 1311
European Space Agency Home 021 449 0006

Framestore technical support:
Mike Coombs 0530 243494
7.30pm - 9.30pm
Ian Gurton 0582 713770
7.30pm - 9.30pm
Dermot Dobson 93 Old Road,
Headington, Oxford. OX3 8SX.

RIG Dish & Feed Horn Stockists:
see back of previous newsletters

Supplier problems co-ordinator, PC-SAT III enquiries
Henry Neale 0945 85353

RIG at Rallies 1990
Mike Coombs see above for No.

RIG MICRO SPECIALISTS:

BBC Micro Position vacant, any volunteers ???

Commodore Amiga James Brown 0656 712632

Atari ST, Archimedes Peter Newman 0487 812121

IBM PC Phil Seaford see above
Please call at sensible hours ie 7.30pm - 9.30pm

RIG - Timestep PCSAT III

A small half sized PC card that will allow the display on IBM PC type computers of APT signals from Meteosat, GOES, NOAA and the Soviet polar Meteor and Okean satellites.

Card type	Half card 8 bit, plate through solder resisted
RFI	FCC part 15 and 1992 EMC compatible
Input	Two separate inputs, 100mV 10K ohm audio (adjustable)
Source	Live or from tape (no sync track needed)
Synchronisation	Derived from subcarrier on Meteosat, GOES and NOAA. From digital signal processing (DSP) on Meteor and Okean. No computer timing or calibrations used (or needed).
Resolution stored on disk	600 pixels 800 lines and 256 intensity levels
Zoom	To pixel resolution regardless of video card
Acquisition	Fully automatic on Meteosat and GOES (any PC). Fully automatic NOAA, Meteor and Okean live or tape (VGA, 286 and above only)
Printing	High resolution HP LaserJet (and clone) driver
Power	Supplied from host computer
Colour	64 greys or 256 colours from colour routine supplied
Contrast	Stretch or compression in linear or non linear
Display resolution	800 x 600 256 colours VGA
	640 x 480 256 or 16 colours VGA
	640 x 400 256 colours VGA (Paradise, Amstrad and Atari)
	320 x 200 256 colours VGA (display only, receive in 640x480x16 mode first)
	640 x 350 16 colours EGA (not NOAA or Soviet)
	320 x 200 4 colours CGA (not NOAA or Soviet)
	640 x 200 16 greys Amstrad 1512 (not NOAA or Soviet)
Cards supported	Any IBM register compatible card
	Tseng Labs chip set (Orchid, Sota etc)
	Paradise (Amstrad, Atari, Viglen etc)
	Video 7
	Trident (legal versions only) (Morse, ZyMOS)
Animation	Flicker free. Any section or zoom, 400 x 300 x 7 (VGA EGA)
Contents	Manual, PC card, software
Input connector	9 way D socket
Price	£137.50 (rally price) plus £3.50 postage and packing

Available from Henry Neale
Thornlea Fishersgate Sutton St James
Spalding Lincs Tel. 0945 85353

RIG SHOP CORNER

Meteosat Downconvertor:-

a) Assembled and tested module in tin plate box:-
£129.69 + £1.50 p&p.

b) Complete mounted in weather proof box:-
£157.96 + £3.00 p&p.

Waterproof power and channel change connector £10.00 extra if required, but note these functions can all be done via the coaxial downlead.

RIG VHF Scanning Receiver

a) Basic receiver module, with LED Channel number display, fully assembled and tested
£112.55 + £1.50 p&p

b) Same module as above but with liquid crystal frequency display module replacing the LED Channel display.
£151.57 + £1.50 p&p

Cheques for above units payable to 'DARTCOM' please

Items below available from the secretary:

The **RIG VHF preamp** also available includes a bandpass filter and is ideal for mast-head mounting. It is available from the secretary as a built and aligned PCB measuring 85mm by 33mm (3 5/16 x 1 15/16 inches). Module including first class post £13.37

28 page booklet entitled: Introduction to Weather Satellites & their Reception by Mike Mansfield. £2.50

Parts for **Low noise Amplifier** - see RIG 18 £30.00
Orders now being taken for next batch. Enquiries re availability to Ian Gurton, Tel 0582 713770.

David Juett YU3 i/f s/w for IBM PC & clones £6.50

Cheques payable to "Remote Imaging Group" please

FRAMESTORE PCBS:

The 001 board of the YU3 framestore design is currently being extensively revised to include buffered 8 bit A-D outputs and ctrl signals, a new Sample & Hold chip, LED activity indicators on all 8 bits and the incorporation of external controls for the A-D chip. The boards are **still** not ready (at 07 Nov 90). Enquiries incl. sae to the secretary please, a reply will be sent when they are ready for sale.

DIGISAT IBM Package

trial offer

We are delighted to offer this superb interface/software package for PC compatibles. Comprising an internal plug-in interface card and software package, it accepts APT inputs directly, providing Super VGA (800 x 600 x 64) graphics. It will, however, work with other graphic environments (e.g. EGA, CGA).

Digisat has a built-in Meteosat schedule, allowing unattended downloading of images. There is an unlimited animation sequence capability (dependant only on hard-disk capacity). Direct temperature readout of 57 pre-programmed European cities is instantly available from I.R. images, and all images are automatically date and time tagged.

This excellent package has to be the best value around!

See RIG 21 for Pete Dobson's review.

Complete Software/Hardware Pkg £150
Carriage £2.50

PCGOES IBM Package

Another super-value IBM PC interface/software package, providing 640 x 480 x 16 graphics (standard VGA) resolution. It lacks some of the Digisat features, but makes it up elsewhere: PCGOES does not offer animation, but it has very good hard copy printer drivers for either dot matrix or laser.

PCGOES also has a Meteosat schedule programmed in, facilitating automatic image downloading.

It features a prediction routine for polar orbiting satellites, which can be run either in real time or speeded-up.

Pete Dobson's review of IBM packages in RIG21 gives further details.

Hardware/Software Package £173

GRAPHSTORE BBC System

The MSG20 Graphstore system is the highest resolution BBC system available, offering 512 x 512 x 128 greyscales, or 256 x 256 x 128 greyscales in 8-frame animation mode. It features zoom, (selectable 1-16) smooth X-Y scrolling, text overlaying, contrast enhancement and density-slicing algorithms. A printer dump package is now also available.

The decode software caters for NOAA and Meteosat - an upgrade will be available shortly for Soviet satellites.

MSG20 Graphstore & Software £347.78
Carriage & Ins. £7.30

AMIGASAT Amiga Package

trial offer

Unlike all other satellite decode packages, Amigasat uses unique high-speed DSP software techniques to decode the APT sognal - achieving outstanding performance with minimal interface hardware. The package is capable of decoding Meteosat, Meteor, and NOAA signals from either live, or taped sources with outstanding image quality.

Features:

- *Extensive use of digital signal processing throughout the package.*
- *Images stored in 8-bit resolution*
- *Preservation of original full-resolution image irrespective of subsequent picture processing.*
- *Zoom - fixed and user-defined.*
- *Decode of new Meteosat digital header, providing image file name.*

Amigasat comprises a software package together with a hardware interface unit to plug directly into your Amiga (specify model when ordering). It will run under Amiga DOS 1.2 (and up), on model 500, 1000, and 2000 machines regardless of age or version, provided there is a minimum of 1 Meg of RAM. Using intuition Amigasat is simplicity to drive; contrast enhancement algorithms for example, can be re-profiled using the mouse to draw any desired contrast stretch!

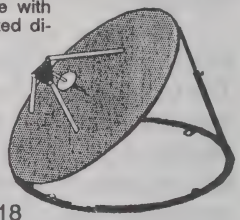
Ongoing development will include comprehensive digital filtering, and automatic Meteosat image downloading.

Because files can be stored in IFF format, standard packages such as D-paint can be used to print and animate images.

£129.50
Demonstration disc £5

MSD20 Meteosat Dish & Feed

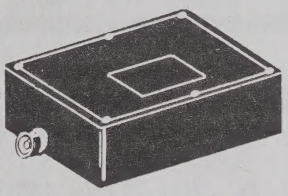
A precision spun aluminium parabolic dish mounted on a rigid tubular steel frame. The 95cm dish comes complete with the MSF20 silver-plated dipole feed assembly, having an N-type 50ohm output socket.



£135.65
Carriage & Ins. £18
MSF20 Feed only £37.50 (carr. £4.25)

MSC20 Downconverter

A Low Noise Downconverter with built-in GaAsFET Preamplifier



This is the lowest noise downconverter in its class (typ. 1.0dB). It features a sealed, weather-proof ABS enclosure and temperature controlled crystals for both Meteosat channels. Output is 137.5MHz, suitable for all standard VHF receivers.

The unit comes complete with all connectors, and N-type/N-type cable for interconnection with dish feed.

£150
Carriage & Ins. £4.25

Archimedes System

Easily the best system available for the Archimedes Whatever model Arch you have, the Spacetech podule will make full use of it, providing high resolution images from Meteosat, NOAA, and Soviet spacecraft.

The award-winning package has all the features you would expect plus many more you hadn't even thought of!

As part of a system using the MSR30 receiver, MSD20 dish, and MSC20 low noise downconverter it offers unrivalled performance to the Archimedes owner.

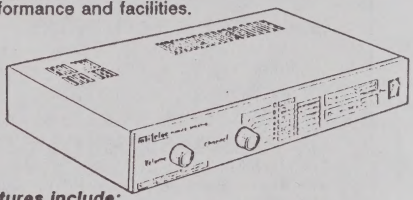
Demonstration disc £5
Podule & Software £260
Carriage & Ins. £4.25

For full details send S.A.E (A5) to receive latest copy of our catalogue and booklist.

MSR30 Synthesized Receiver

A new VHF receiver suitable for NOAA/Meteosat reception.

This meticulously designed and engineered second-generation receiver sets new standards in performance and facilities.



Features include:

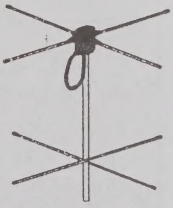
- *Good sensitivity with high interference rejection*
- *Built-in scanner with intelligent halt*
- *Auto tape record facility, with adjustable dropout delay*
- *Automatic frequency control*
- *Adjustable APT output level*
- *Separate internal PSU for downconverter*
- *Tailored APT passband filtering*

£285
Carriage & Ins. £7.30

MSA20 VHF Aerial

A well-made crossed-dipole aerial for NOAA reception, cut for 137MHz operation.

Supplied fitted complete with phasing harness and 20 metre of cable and a BNC plug.



£34.74
Carriage & Ins. £6

trial offer

14-day money back trial offer on these products!

ORDERING INFORMATION

Prices exclude VAT, add 15% to total for U.K. orders. Where not indicated, carriage should be added at £1.50. For more than one item, the maximum carriage charge is £7.30 (£18 if MSD20 is included). Overseas rates are available on request. Payment may be made by cheque, postal order payable to 'Martelec Ltd'. ***Visa*** & ***Access*** cards accepted.

8 Kimber's Lane, Farnham, Surrey GU9 9PT, U.K.

Tel/Fax (44) 0252 737620 Mobile 0836 297252

PROLOGUE COMPUTERS LTD

2 ORCHARD RISE, OLVESTON, BRISTOL
BS12 3DY. TEL. 0454 612882/325430

□ IBM COMPATIBLE COMPUTERS

XT –V20 12MHz. 640Kb RAM. 360 or 720Kb Floppy drive. 102 key enhanced keyboard.
5 Free Expansion slots, VGA mono monitor –640*480 pixels / 64 grey levels.
Serial and parallel ports. £559.00

AT –286 12MHz. 1Mb RAM (expandable to 4Mb). 1.2 or 1.44Mb Floppy drive.
Small footprint deluxe case, 200W PSU. 5 Free Expansion slots.
VGA Mono monitor –640*480 pixels / 64 grey levels. Paradise 512kb VGA card.
AMI BIOS £667.00

386 SX –16MHz. 1Mb RAM (expandable to 5Mb). 1.2 or 1.44Mb floppy drive.
Small footprint deluxe case, 200W PSU. 5 Free expansion slots.
VGA Mono monitor –640*480 pixels / 64 grey levels. Paradise 512kb VGA card.
AMI BIOS. £850.00 **

386 –25MHz. 1Mb RAM (expandable to 4Mb on m/b). 1.2 or 1.44Mb floppy drive.
Small footprint deluxe case, 200W PSU. 5 Free expansion slots.
VGA Mono monitor –640*480 pixels / 64 grey levels. Paradise 512kb VGA card.
£1156.00 **

□ OPTIONS:

VGA Colour monitor 14" (640*480). add £170
Super VGA colour monitor 14" (800*600). add £230
Mini tower case add £20
20Mb 65ms Seagate hard disk (inc. 16 bit controller) £214.
42Mb 28ms hard disk (inc. IDE controller). £239
Mouse (serial or bus interface). £30
MS DOS V3.3. £49

□ BAREBONE SYSTEMS:

XT 12MHz, 150W PSU, Case £153.00
AT–286 12MHz, 200W PSU, Deluxe Case £239.00
386SX 16MHz, 200W PSU, Deluxe Case £414.00 **
386 25MHz, 200W PSU, Deluxe Case £680.00 **

□ COMPONENTS:

MOTHERBOARDS : XT – £68, AT 286 – £136, 386SX – £320 **, 386–25 – £569 **
VGA CARDS : Paradise 256kb (640*400*256 colours, upgradable to 512kb) £98.00
Paradise 512kb (640*480*256 colours etc.) £114.00
Tseng Labs 1Mb (1024*768*256 colours – multiscan only) £219.00 **
MONITORS : 12" VGA mono £107, 14" VGA colour £270
14" Super VGA colour £340, 14" multiscan colour £380
FLOPPY DRIVES : TEAC 360/720kb – £64, 1.2/1.44mb – £69
HARD DISKS : SEAGATE ST225 20mb – £165, ST251–1 40mb 28ms – £225

Normal delivery – 5 Working Days. ** Items within 28 Days

spacetech

Space Science Resources

21 WEST WOOLS, PORTLAND,
DORSET DT5 2EA UK

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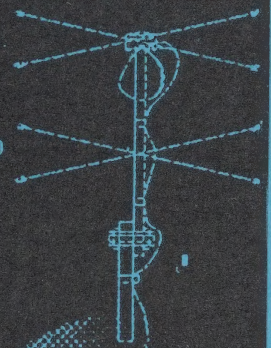
Write or telephone for details on our complete range, and if you have an Archimedes, ask about.....



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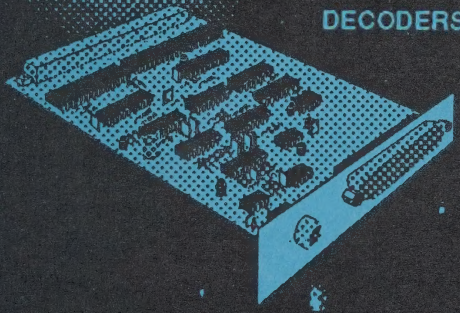
PLUS. . . .



DECODERS

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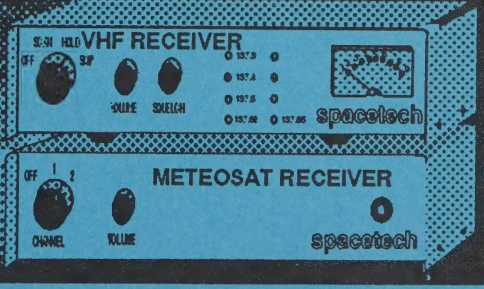

BOOKS
SLIDES
POSTERS
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ETC
ETC. . . .

What's Up Doc ?

OK, so now we have your attention ! The point of the title is to alert readers to the fact that all our advertisements are different, even if they look the same. Each has some information that you may find useful. And each has the hard sell necessary to keep us in business and allow us to keep bringing out new and exiting products.

We want you to see that we are furthering the cause of Home Weather Satellite Users. Actually we want you to send for our new catalogue ! Just write RIG22 and your name and address on the back of an envelope and we will send you a brand new catalogue full of interesting articles and products. It's only going to cost you 17p and you don't need to write a letter ! Even if you have all the equipment you need, the technical content may interest you. You will also get a set of polar elements that are less than 7 days old !

PCSAT III

The definitive package that will receive, NOAA, Meteor, Okean, Feng Yun, Meteosat, GOES, and GMS. They are all different, and we use software not hardware to decode them for an easy simple upgrade path, even if new satellites are launched. Don't be stuck with old designs, ask if OKEAN will work from a mono tape AND if it is stored in FULL resolution. Ours does of course. More important is the fact that FULL resolution is ALWAYS stored, if you want to look at any of the 256 levels transmitted, you can. Other systems simply throw this data away. "Everybody is telling us it's the best thing that has happened" quote from Henry Neale RIG Chairman, RIG 22. "Brilliant results from Okean" Les Currington RIG Soviet expert. "Does everything properly" Lawrence Harris Shortwave Magazine columnist. "The best colour manipulation and the most versatile graphic support" John DuBois Dallas Remote Imaging Group committee member and the HRPT Guru. In stock from Henry Neale RIG.

NOAA, Meteor, Okean, Feng Yun

Our PC software supports all these modes, live or from tape in full resolution. Our ProScan receiver supports all frequencies. Our customers did not have to re-program their synthesizers or buy new crystals when Feng Yun came up. In stock now !

VGA FAX

A brilliant HF Fax program that works in all modes including VGA in 16 shades of grey. No complicated computer timing or wandering images ! Receiving FAX, RTTY and NAVTEXT, this unit has a high performance, level insensitive, interface. £99.00 inc VAT and postage.

Polar Quadrifilar Helix Antenna

No nulls, horizon to horizon coverage and as used by the NOAA satellites. Radiation from the quadrifilar helix antenna is circularly polarised and of the same screw sense everywhere thought the radiation sphere. It matches 50 or 75 ohm co-ax perfectly and impedance mismatch will not skew the radiation pattern as is the case with crossed dipoles. This is the antenna that the professionals use. Available February or sooner.

HRPT High Resolution NOAA data

Some of you may have seen John DuBois article in JESUG about his incredible system. If you haven't read this article ask us for a copy. Basically Timestep have currently the only licence to produce this system outside of the USA. It is amazingly simple and the resolution of 1.1Km coupled with digital noise free transmissions is simply startling ! You will need a steerable dish or multiple yagi system and a low noise pre-amp. If you are getting noise free images from Meteosat then your antenna and pre-amp is probably OK as it is. We will then supply a special (a) a 6 channel HRPT receiver that simply plugs into your antenna/pre-amp system and (b) a PC card and (c) software. All these three items should cost less than £700 in total and they will be available separately for experimenters. It is not impossible to convert an existing Meteosat convertor to HRPT, but it needs a lot of work. You will notice that our HRPT receiver has 5 channels fitted, this is correct. Feng Yun has HRPT, and you will want to be able to receive everything available. In stock February or sooner.

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